Notebook, Volume 13

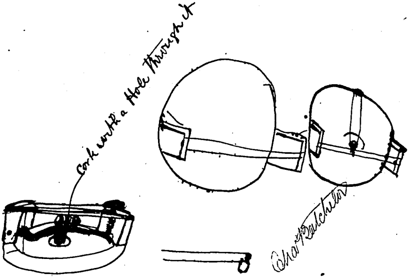
This volume covers the period October-December 1877. The notes and drawings are by Edison, Charles Batchelor, and James Adams and relate to the speaking telegraph and telephone. The volume consists of 204 numbered, unbound leaves.

There is also a drawing of the phonograph, dated November 29, 1877, which contains the page/volume inscription "154/13" and which may have been considered part of this volume. This drawing, which some scholars think was used by John Kruesi to construct the first phonograph, has been filmed with other early phonograph drawings in NS-77-003, Unbound Notes and Drawings.

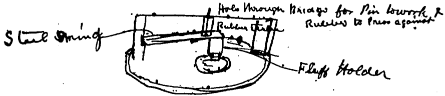
Missing pages, found in facsimile in the Telephone Interferences: 1-2, 4-10, 12-13, 15-34, 36-43, 45-48, 50-51, 53-55, 57, 60-65, 67-77, 79-80, 82, 84, 86, 89-91, 93-96, 98-100, 102-106, 108, 110, 112, 114-117, 119-121, 124-128, 130-133, 136-141, 143, 147-153, 155, 158-169, 175-177, 179-180, 202-203.

Missing pages: 3, 11, 14, 44.
Page 11 was found, microfilmed in a supplement, and included here.

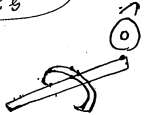
Speaking telegraph Oct 2d 1877

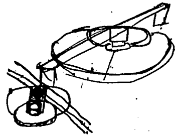

Cork with a Hole through it

Chas Batchelor


Hole through Bridge for Pin to work & Rubber to Press against
Rubber [illegible]
Steel Spring
Fluff Holder

Edisons Exhibit
1-13.
S.L.G.



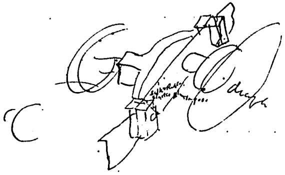


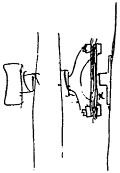
James Adams
T A Edison

EDISON'S EXHIBIT..2-13.

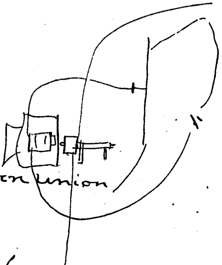
45 Speaking Telegraph

Oct 3 1877
T A Edison
Chas Batchelor
T. A. E.





x pieces of plumbagoed Cloth



Wabash

Boston

Morning

Boston Boston

Morning Telegram

Morning T

Boston
Boston Boston

Wabash Valley R R

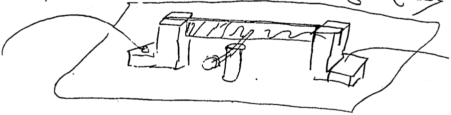
Western Union

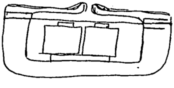
EDISON'S EXHIBIT. 4–13.

Spkg Telegh

October 6 1877
T A Edison
Chas Batchelor

Plumbagoed hard rubber on one side pass the current through it that causes heat & bulging - propose to connect to diaphragm & receive talking by these expansions on the passage of the current



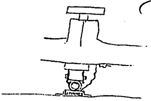


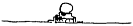
Western Union Telegraph
Telegraph Westan Western Union Telegraph
Boston Boston Boston Boston Boston
Telegram Boston Boston Boston Western
c
Western
Western
Western

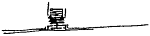
EDISON'S EXHIBIT. 5-13.

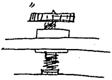
Speaking Telegraph

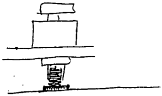
October 3rd 1877
T A Edison
Chas Batchelor







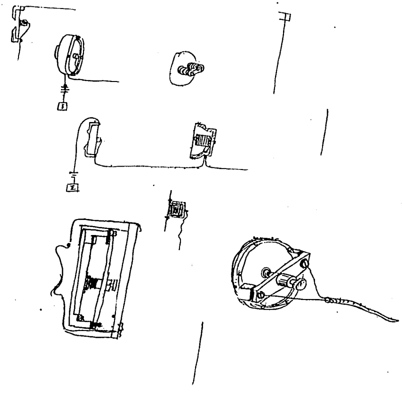




EDISON'S EXHIBIT. 6–13.

Speaking Telegraph

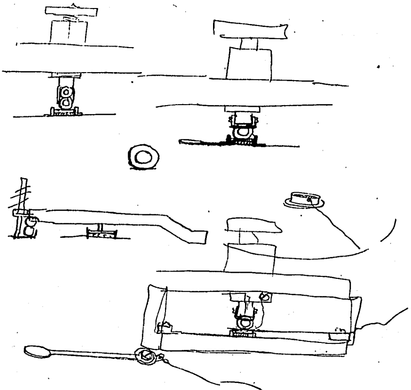
Oct 3rd 1877
T A Edison
Chas Batchelor



EDISON'S EXHIBIT. 7-13.

Speaking Telegraph

October 3rd 1877.
T A Edison
Chas Batchelor

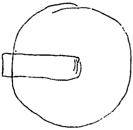


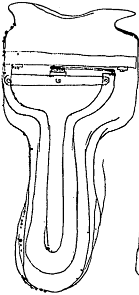
Edisons. Exhibit 7—13
S. L. S.

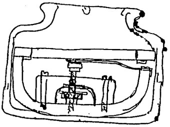
EDISON'S EXHIBIT. 8-13.

Speaking Telegraph

Oct 4. 1877.
T A Edison
Chas Batchelor



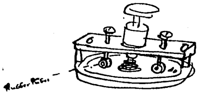




EDISON'S EXHIBIT. 9-13.

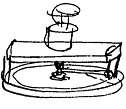
Talking Telephone

Dec 4 1877
T A Edison
Chas Batchelor



Extra Screws and Rubbers to dampen the diaphragm

Boston Boston



Extra Lever thus harmonica

Boston Bosto

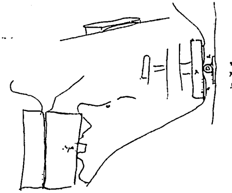
Edisons Exhibit
9—13.
S. L. S.

EDISON'S EXHIBIT. 10–13.

452
Speaking Telegraph

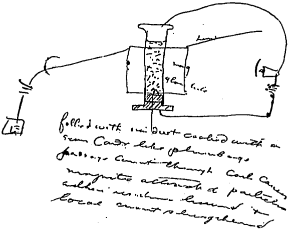
Oct 5 1877 T A Edison

Chas Batchelor

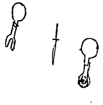


rubber ring around it [illegible] solid fluid
x is insulated with [illegible] plumbago [illegible]
for [illegible] uniform [illegible] [illegible].

two plumbagoed diaphragms



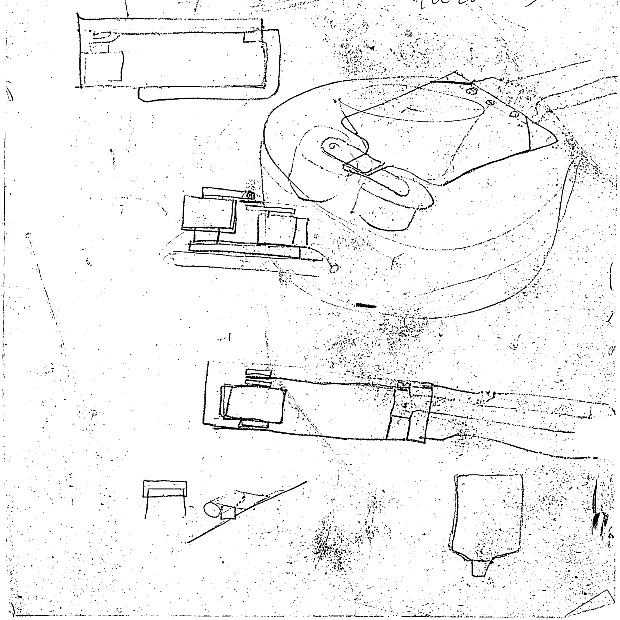
filled with iron dust coated with a
semi Cond. like plumbago
passage current through Coil causes
magnetic attraction of particles
& their resistance lowered &
local current strengthened



457

Spkg Telegh

Oct 5 1877
TA Edison



Unbound Notebooks, Volumes 8-18

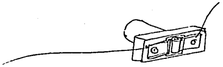
Vol. 13 (p. 11)

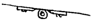
EDISON'S EXHIBIT. 12–13.

456

Oct 5 1877
T A Edison

Chas Batchelor

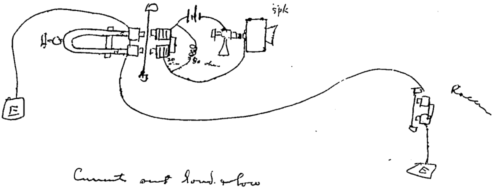




Oct 5 1877
T A Edison
Chas Batchelor

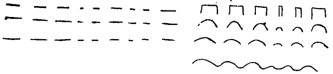
453
Speaking Telegraph

We have just made complete instrument for working on the new principle of turning straight waves from a Reiss point into undulatory waves it works real bad



Current out loud & low

Same strength
in magnet, shunt
diaphragm works
Read



EDISON'S EXHIBIT. 15-13.

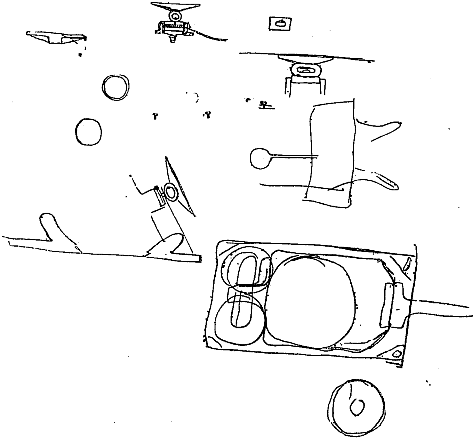
458

Speaking Telegraph

Oct 5 - 1877

T A Edison

Chas Batchelor



EDISON'S EXHIBIT. 16-13.

[illegible]

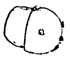
Spkg Teleph

Oct 5/1877

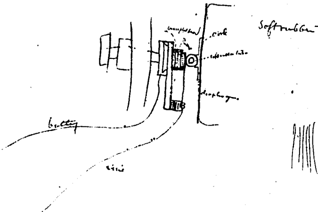
Chas Batchelor

T A Edison

We at last adopt the small sharp edged hole to speak through have tried every conceivable kind of holes in thick & thin stuff also various shapes of holes & groups of holes slots Etc, round 3/16 hole pbly best



We have adopted a new method of working the Semi Conductor

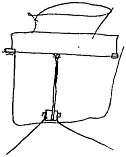

compressed
cork
soft rubber tube
diaphragm
battery
line
Soft rubber to Guide —

Edisons Exhibit
16 — 13
S.L.D.

EDISON'S EXHIBIT. 17–13.

Spkg Tel

Oct 6 1877
T A Edison
Chas Batchelor

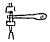


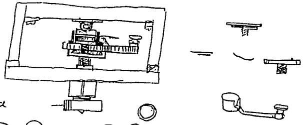
Edisons Exhibit 17 – 13
S. L. G.

EDISON'S EXHIBIT. 18-13.

Speaking Telegraph

Oct 6 1877.
T A Edison
Chas Batchelor





Club

Chicago

now by the beard
of the phrophet

Edisons Teleph

phrophet

Telephone

Constantinople Telephone

Edisons Telephone

Telephone

Telephone

Telephone

Telephone

Telephone

Boston Telephone

Telephone

Telephone

[illegible] was [illegible]

A Johnson Telephonist Lecturer

Exhibitor of Telephones [illegible]

Centennial Commission Travelling player

of [illegible] to [illegible]

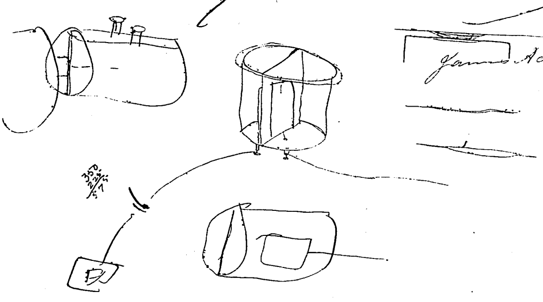
Telephone

EDISON'S EXHIBIT. 19-13.

Spkg Teleph

Oct 9 1877

T A Edison

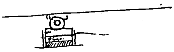


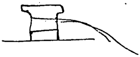
James Adams

EDISON'S EXHIBIT. 20–13.

Spkg Tel

Oct 10 1877
T A E





EDISON'S EXHIBIT. 21–13.

A60

Blank No. 2.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company TRANSMITS and DELIVERS messages only on conditions, limiting its liability, which have been assented to by the sender of the following message.

Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages.

This message is an UNREPEATED MESSAGE and is delivered by request of the sender under the conditions named above.

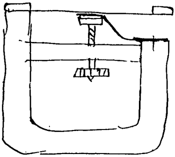
A. R. BREWER, Sec'y. WILLIAM ORTON, Pres't.

Dated ______________________ 187

Received at 14 *Exchange Place, Jersey City, N. J.*

To ______________________

READ THE NOTICE AT THE TOP.



Oct 16 1877
TAE
James Adams

EDISON'S EXHIBIT. 22–13.

467

Blank No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company TRANSMITS and DELIVERS messages only on conditions, limiting its liability, which have been assented to by the sender of the following message.
Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages.
This message is an UNREPEATED MESSAGE and is delivered by request of the sender under the conditions named above.

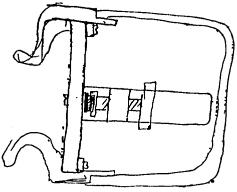
A. R. BREWER, Sec'y. WILLIAM ORTON, Pres't.

Dated ____________________ 187

Received at 14 *Exchange Place, Jersey City, N. J.*

To ____________________

READ THE NOTICE AT THE TOP.



James Adams

Oct 16
Jan. / 77

EDISON'S EXHIBIT. 23–13.

464

Blank No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company TRANSMITS and DELIVERS messages only on conditions, limiting its liability, which have been assented to by the sender of the following message.
Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages.
This message is an UNREPEATED MESSAGE and is delivered by request of the sender under the conditions named above.

A. R. BREWER, Sec'y. WILLIAM ORTON, Pres't.

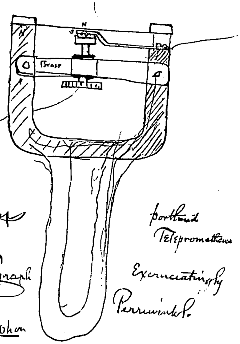
Dated ______ 187

Received at 14 Exchange Place, Jersey City, N. J.

To Telephone Telephone

READ THE NOTICE AT THE TOP.

Oct 16/77
7 AM



Adams

Speaking Telegraph

Speaking Telephon

portland

Telepromethews

Excruciatingly

Perriwinkle

EDISON'S EXHIBIT. 24-13.

1161

lank No. 1.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company **TRANSMITS** and **DELIVERS** messages only on condi ility, which have been assented to by the sender of the following message. Errors can be guarded against only by repeating a message back to the sending comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages. This message is an **UNREPEATED MESSAGE** and is delivered by request of the sender under the conditions named above.

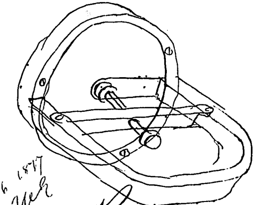
A. R. BREWER, Sec'y. WILLIAM ORTON, Pres't.

Dated ____________________ 187

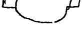
Received at 14 *Exchange Place, Jersey City, N. J.*

To ____________________

READ THE NOTICE AT THE TOP.



Oct 16 1877
TAE
James Adams



EDISON'S EXHIBIT. 25-13.

THE WESTERN UNION TELEGRAPH COMPANY.

This Company TRANSMITS and DELIVERS messages only on conditions, limiting its liability, which have been assented to by the sender of the following message. Errors can be guarded against only by repeating a message back to the sending station for comparison, and the Company will not hold itself liable for errors or delays in transmission or delivery of Unrepeated Messages. This message is an UNREPEATED MESSAGE and is delivered by request of the sender under the conditions named above.

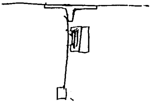
A. R. BREWER, Sec'y. WILLIAM ORTON, Pres't.

Dated ________________ 187

Received at 14 Exchange Place, Jersey City, N. J.

To ________________

Telephone oct 16 1877 T.A.E.



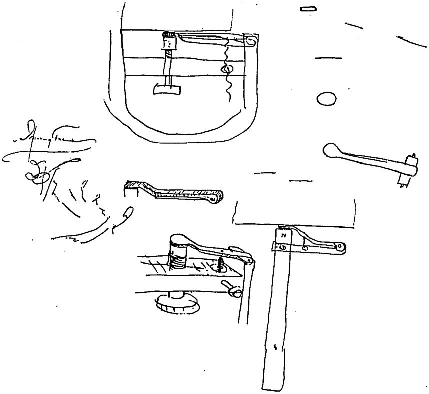
James Adams

READ THE NOTICE AT THE TOP.

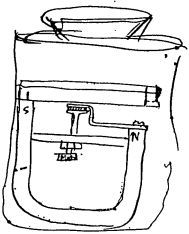
EDISON'S EXHIBIT. 26-13.

Speaking Telegraph

Oct 18 1877
T A Edison
Chas Batchelor


Spring Tension
N
S

EDISONS EXHIBIT. 27-13.



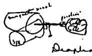
Oct 18 1877
T A Edison

EDISON'S EXHIBIT. 28-13.

Spkg Telegh

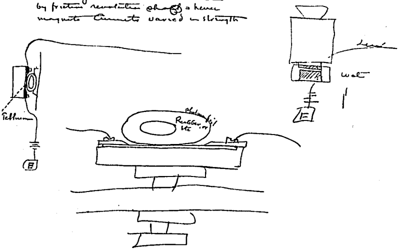
Oct 21 1877
T A Edison
Chas Batchelor

Magneto



Electric Eng.

Diaphragm increases resistance by friction revolution changes hence magneto currents varied in strength

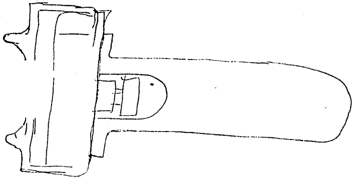

X Tellurium
E
Platina foil
Rubber, or etc
line
wat
E

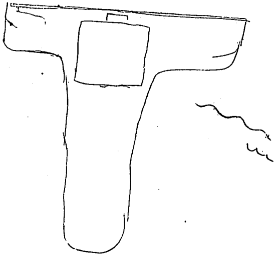
Instead of Tellurium; Red Phosphorus may be used

EDISON'S EXHIBIT. 29–13.

Spkg Teleph

Oct 21 1877
TAE
Chas H Batchelor



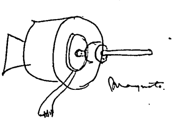


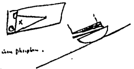
EDISON'S EXHIBIT. 30–13.

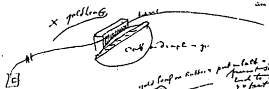
470

Geo E Carman

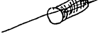
Oct 21 1877
T A Edison
Chas Batchelor




x
iron phosphor.


x goldleaf
Level
Cork on diaphragm
C

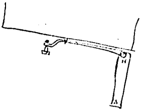
gold leaf on rubber put in lathe a fine knife edge tool run in from screw gear feed from end to end so that strip will be 50 feet of gold that current must pass through the spring in diaphragm [illegible] to act in [illegible] [illegible] be [illegible] if

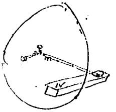


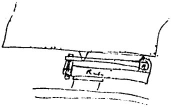
EDISON'S EXHIBIT. 31–13.

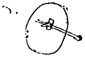
Spkg Telegraph

Oct 21 1877
T A Edison









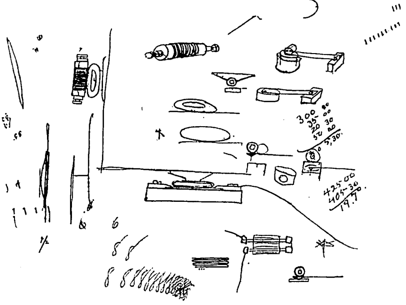
EDISON'S EXHIBIT. 32-13.

Speaking Telgh

Oct 21 1877
T A Edison

Tests with perfectly flat plumbago. mixed with diff Substances with flat discs on it held there by diaphragm and piece of rubber Tubing,

{ 144: 15 grammes Plumbago
6 grammes Rubber in B. Sulcarbon

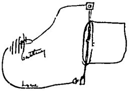

300 80
35 00
20 30
50 80
5.30.
425 00
405 30
19.70.

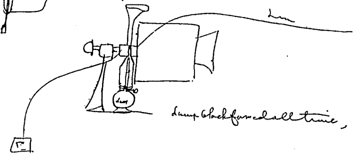
EDISON'S EXHIBIT. 33–13.

469

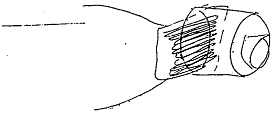
Spkg Telegh

Oct 21 1877
TA Edison
Chas Batchelor





Lamp black formed all time,

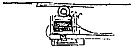


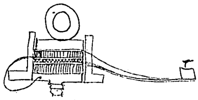
Hard Rubber diaphragm gives heat and Cold waves these acting on Gold or other foil in a plate scratched so that about 50 feet of it is exposed to Rubber & through which the Current passes permanently the heat & Cold waves increase & decrease the resistance & thus give waves.

EDISON'S EXHIBIT. 34–13.

Sept 22/77
Chas Batchelor

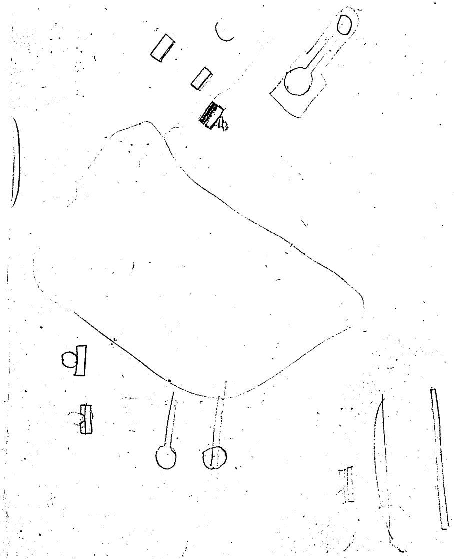
Sa Edison





Speaking Telegraph 478

Oct 22d 1877



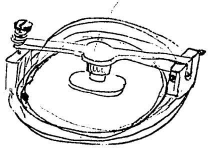
EDISON'S EXHIBIT. 36-13.

Speaking Telegraph Sept 22 1877

TA Edison

Chas Batchelor

"Edisons Exhibit
36—13."
S.L.S.



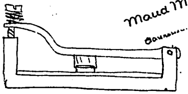
Maud Muller on a summers day.

Maud Muller on a summers

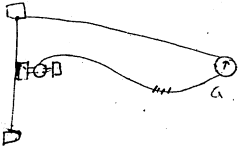
Boston water power

Rochester Business College

[illegible]



[illegible]

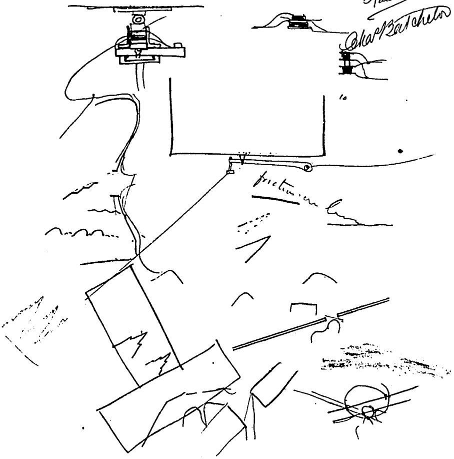


EDISON'S EXHIBIT. 37-13.

Dec 22/77

J Adams

Chas Batchelor

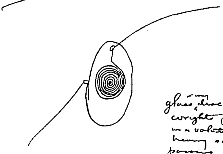


10
friction on

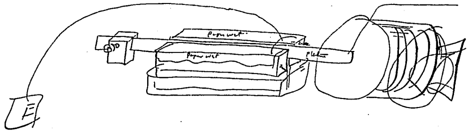
EDISON'S EXHIBIT. 38-13.

Speaking Telegraph

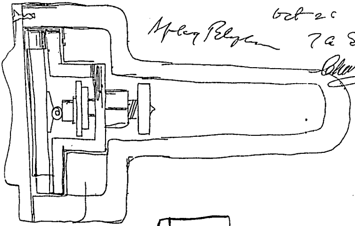
Oct 26 1877
T A Edison
Chas Batchelor



glass or mica disc coated with gold &c by Wright process and then cut in a volute spiral the diaphragm having same with constant current passing through the coils inductively on other, or it may be a steel diaphragm permanently magnetized =


Line
Paper wet
Paper wet
Zinc
Platina
D
1
2
E

EDISON'S EXHIBIT. 39–13.

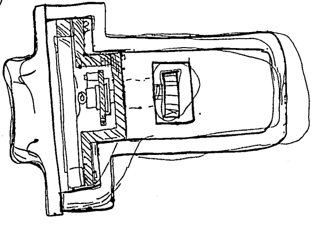


Spkg Telephone

Oct 20 1877

T A Edison

Chas Batchelor

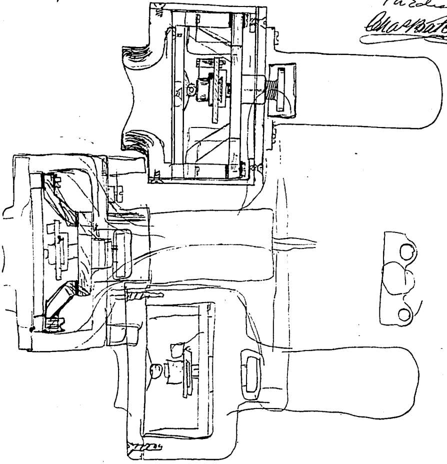


504

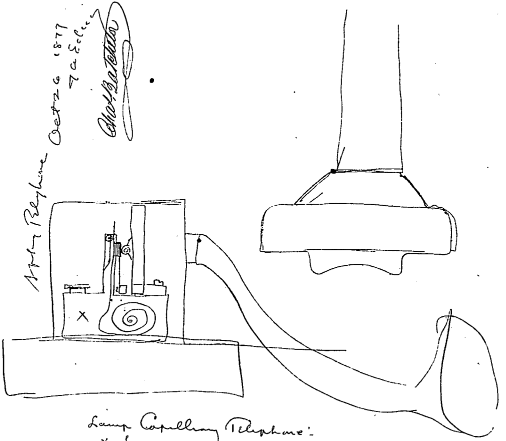
EDISON'S EXHIBIT. 40-13.

Apby Polyform

Oct 26 1877
T A Edison
Chas Batchelor



EDISON'S EXHIBIT. 41–13.



Spring Telephone Oct 26 1877
T A Edison

Chas Batchelor

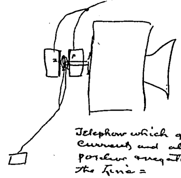
Lamp Capillary Telephone:-
x has supply of the Conducting Liquid
c is an absorbent material passing upward.
where pressure between 2 Electrodes may be
varied by diaphragm whole placed in box with flex tube

EDISON'S EXHIBIT. 42–13.

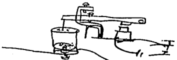
#84

Spkg Telegraph

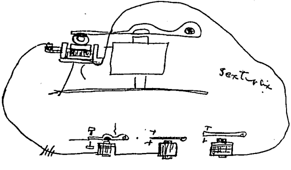
Oct 26 1877
T. A. Edison
Chas Batchelor



Telephone which generates its own currents and also which sends positive & negative current on the line =



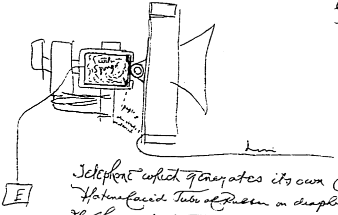
put a common Telephone in ckt with Extra diaphs connected to sounders. then good many can be [illegible] and several ops picking out the sounds of the little pulses



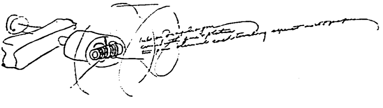
EDISON'S EXHIBIT 43-13.

Speaking Telegraph

October 26, 1877
T. A. Edison
Chas Batchelor

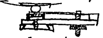

water sponge
paper
or other material
Line
E

Telephone which generates its own current
Platina faced Tube of Rubber on diaphragm
If these not strong enough and it appears to be from the Experiments we tried, then it may be arranged for intensity

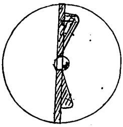


we tried Experiment tonight that was very successful in this [illegible]

EDISON'S EXHIBIT. 45-13.

Kreusi Make 4 of these (goodones) telephones
right away Complete
Mouth piece just a flat piece of rubber so
Rubber piece screwed on with 3 screws
hole in rubber exactly same
Would like ant. adjustment on the spring
like this  + an insulated connection screw
on bridge to wire to ~~connect~~ to
Batchelor Oct 1877
Haveman help

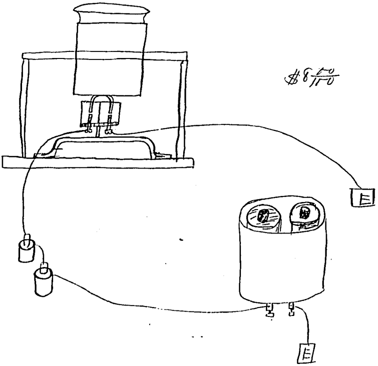
T A Edison



EDISON'S EXHIBIT. 46-13.

Aug 22	Gold & Stock telephone	5 hours	Af
" 23	" " "	22 "	
" 24	" " "	1 "	
" "	Shopwork with Plumbers	2	
26th	telephone	20	
27	"	7	
28	"	9	
"	Shop work	4	
"	Showing Machine	2	
"	Expenses for ditto		$\$1\frac{30}{100}$
29	Telephone	4	
		76	

Aug 30th Speaking telegraph Model



$\$8\frac{50}{100}$

EDISON'S EXHIBIT. 46-13.

X Sept 25	Fluff cups ~~7 hours~~	7 "	
" 26	Taps & Dies for fluff cups	8 Hours.	
" "	telephone	3 "	
" 27	Retaining Engine	2 "	
" "	fluff cups	6 "	
		26	

Sept 1st	Speaking telegraph	10 hours At	
" 2	" "	9 "	
" 7	Left-hand Split Die	4 "	
"x 14	6 Stations of telephones at $6		$36
" 27	12 " " " " $6		$72
" 29	2 Call Bells at 1.75		$3 50
Oct. 1	Telephone	8 "	
" 2	"	8 "	
3	"	2 "	
4	"	14 "	
6	"	16 "	
7	" Experiment	3 "	
8	" "	6	
9	"	7	
10	Pattern for telephone	1	
11	Experiment on telephone	10 75	
15	12 Stations of telephones at $6		72 00
"	22 Call Bell at $1.75		38 50
16	Experiments on telephone	17	
17	" "	11	
18	" "	22	
19	" "	20	
20	" "	9	
"	Kruger's man 88 at 17¢		$14 96
21	telephone Experiment	19	
22	" "	15 211	
23	" "	6.	
24	" "	19	
25	" "	5	
26	" "	9	
27	" "	8	
28	telephone Model for Murray		
	fixing for his Diaphrams	12	
29	Murray Newark	9	
	Diaphroghms	4	
30	" "	9	

486

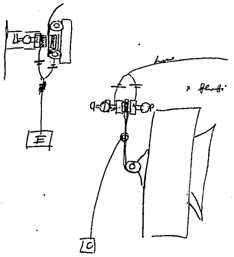
Speaking Telegraph

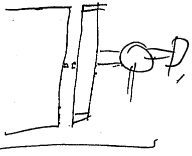
Nov 1. 1877.

T A Edison

Chas Batchelor

Reversed Current

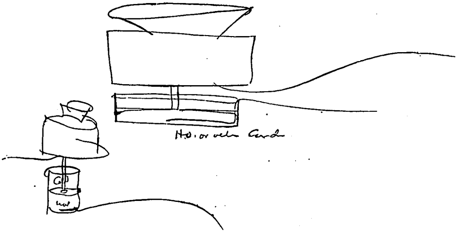

line
x plug
E
C



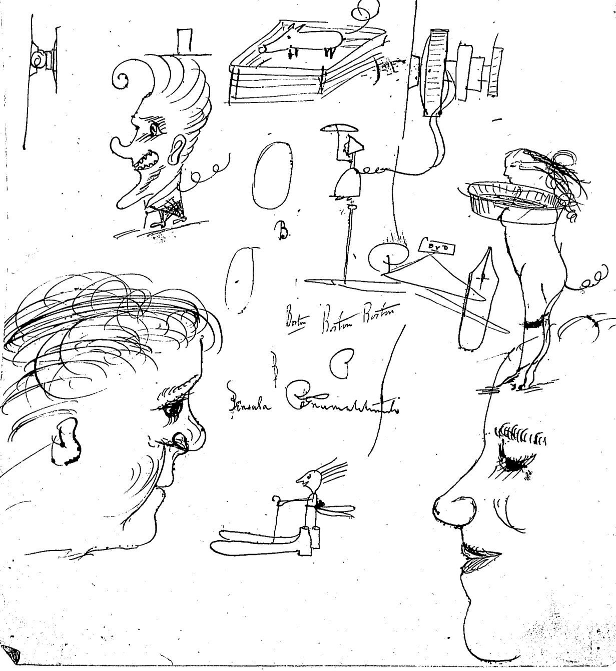
EDISON'S EXHIBIT. 48–13.

Spkg Telegh

Nov 1 1877
TAEdison


H.O. or other Cond
Cu

Apkq Tel Nov 1 1877
T A Edison

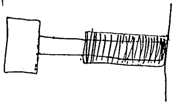


B.
Bostn Boston Boston
Jensula

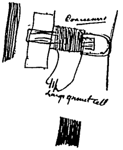
EDISON'S EXHIBIT. 50-13.

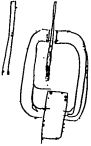
Speaking Telegh

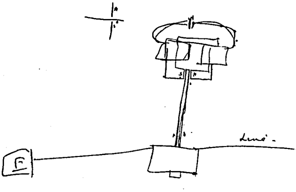
Nov. 1 1877



stretch magnetizing coil whole of platina, being thin maximum make its magnetizing power by shunting in & out new convolutions,


Condenser
Large ground cell





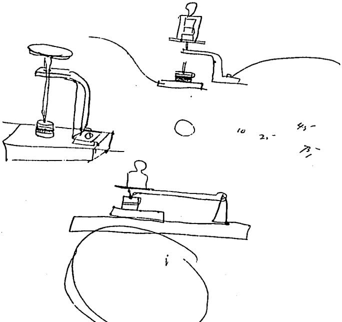
EDISON'S EXHIBIT. 51–13.

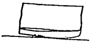
487

Speaking tel

Nov 1st 1877

Chas Batchelor

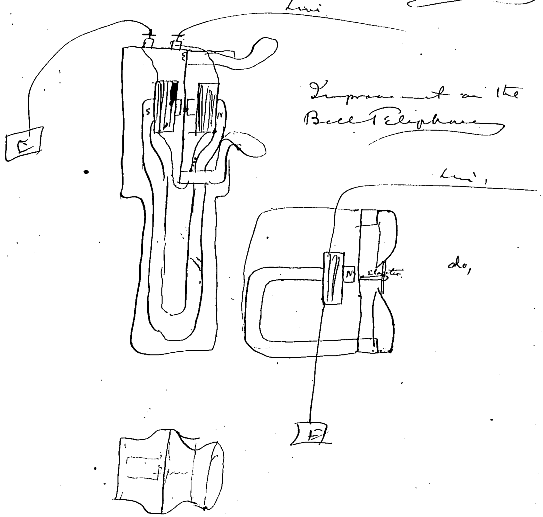




489

Speaking Telegraph

Nov 1 1877
T A Edison
Chas Batchelor


Line
+
−
S
N
E
Line
N
Elastic
E

Improvement on the Bell Telephone

do,

T. A. EDISON,

Menlo Park, N. J., 1880.

Vol 13. P. 53

Berke & Co

Oct 8

EDISON'S EXHIBIT. 53-13.

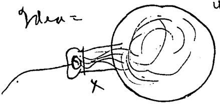
[illegible] Nov 3 1877

Faraday Page 27 Vol II Researches T A Edison

Good Conductors — Galena — Sulphuret of iron — Arsenical pyrites = native sulphuret Copper + iron native gray and artificial sulphuret of ~~iron~~ copper Sulphuret of Bismuth gray + Copper globules of oxide of burnt iron, oxide of iron by heat or scale iron = Conduct current single Thermo pile well = native Peroxide of Manganese + peroxide of lead conduct moderately well.

A Solution of Sulphuret of Potassium is a remarkably good Conductor also, presents nitrous acid = Sulph Pot. has no action on the ~~metals used~~ iron + platinum together

Idea =

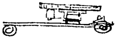


disk of Lampblack. thinnest tin foil laid on it roll against it or Coat it with thick gold foil. continuing foil on to paper X. the foil will adhere then varnish foil & roll against it

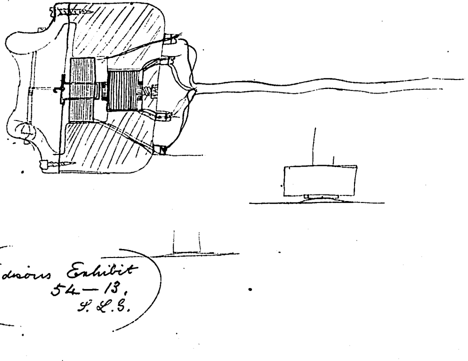
EDISON'S EXHIBIT. 54-13.

Speaking Telegraph

Nov 5 1877
T A Edison
James Adams



On phonograph I propose having a cylinder 10 threads or embossing grooves to the inch cylinder 1 foot long on this ~~tt~~ tin foil of proper thickness arranged with cylinder is transmitter with embossing point running in these grooves or over them when cylinder rotated, I have tried various experiments with wax chalk etc to obtain an easy indenting surface but found that tin foil over a groove is the easiest of all = this cylinder will indent about 200 spoken words & reproduce them from same cylinder =



Edisons Exhibit
54—13,
S.L.S.

EDISON'S EXHIBIT 55-13.

490

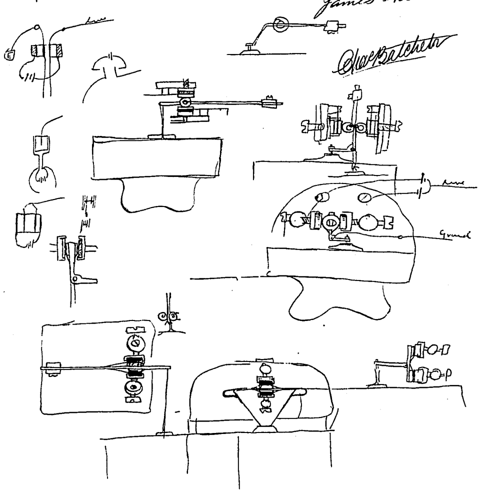
Speaking Telegraph

November 5 1877

T A Edison

James Adams

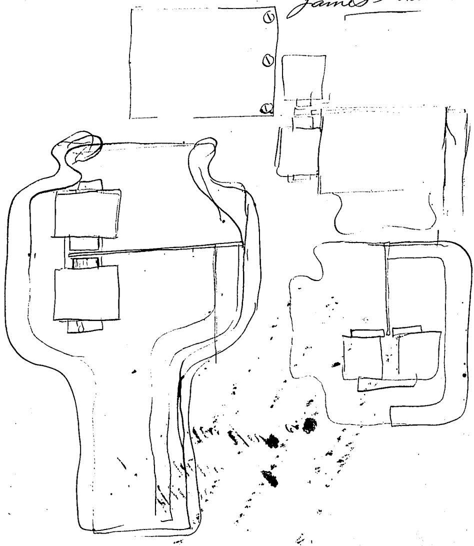
Chas Batchelor


Line
E
Line
Ground

N92

Speaking Telegraph

Nov 5th 1877
T A Edison
James Adams

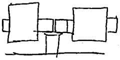


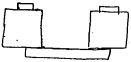
EDISON'S EXHIBIT. 57–13.

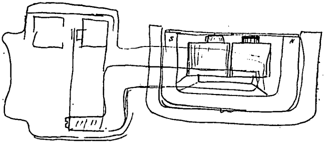
#43

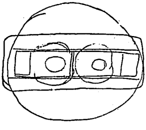
Spkg Telephone

Nov 4 1877
T A Edison
James Adams



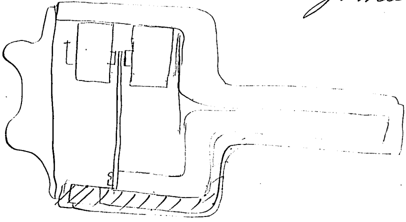




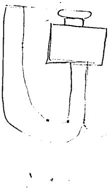


Speaking Telephone

Nov 5 1877
T A Edison
James Adams

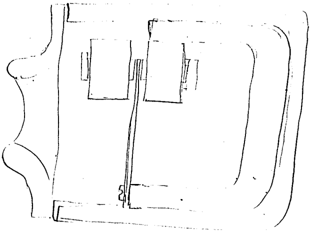


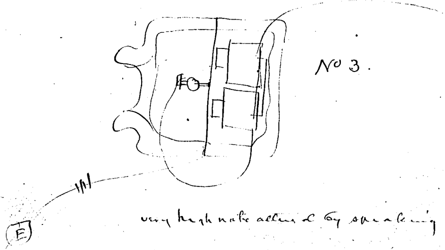
No 2.



Spkg Telephone

Nov 5 1877
TA Edison
James Adams





No 3.

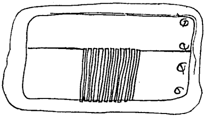
very high note allowed by speaking

EDISON'S EXHIBIT. 60-13.

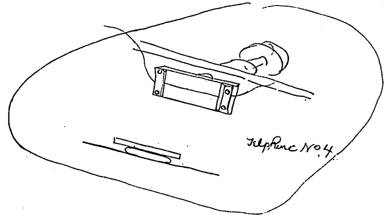
T A Edison

Nov 5/77

James Adams



Magneto Electric Telephone

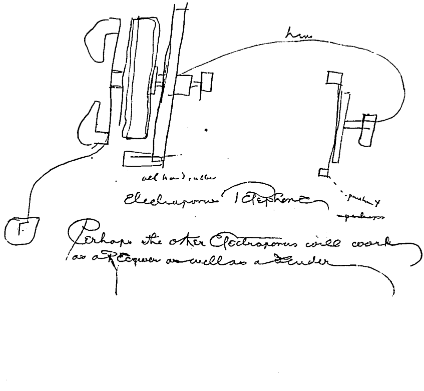

Telphone No 4.

EDISON'S EXHIBIT. 61–13.

447

Speaking Telephone

Nov 5th 1877
T A Edison
James Adams


line
all hard rubber
parchm y
perhaps
T

Electrophorus Telephone

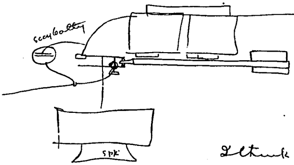
Perhaps the other Electrophorus will work as a Reciever as well as a Sender

498

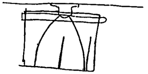
Spkg Telephone

Nov 5 – 1877
T A Edison

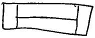
James Adams


secy battery
spk

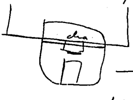
I think an arsenical mirror antimony or tellurium as in Marsh ~~test~~ would be good strip to vary potential or (Res) ~~to act~~ as a resistance to be varied by diaphragm
try this tomorrow

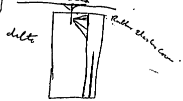


-Water Telphone



draw line of or spread nitrate silver over glass & reduce by phosphide calcium




dia
Rubber elastic cone
dilute

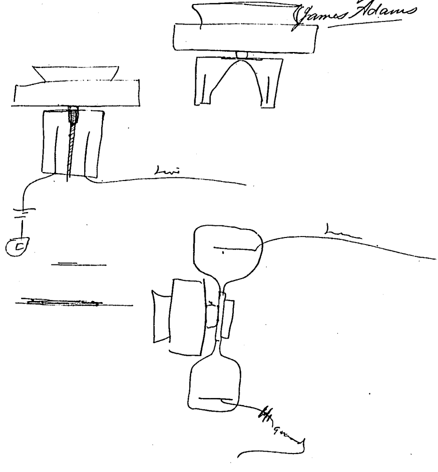
EDISON'S EXHIBIT. 63–13.

499

Nov 5 1877.

T A Edison

James Adams

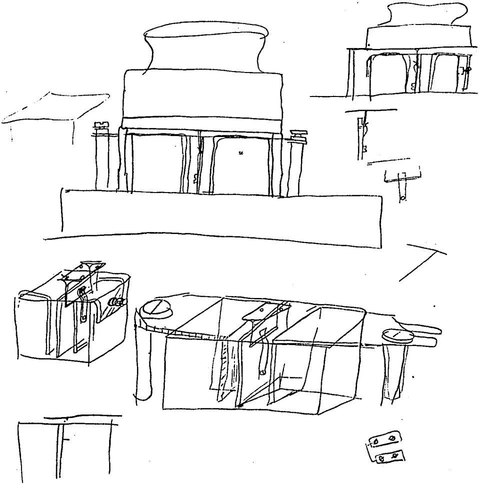

Line
C
Line
ground

EDISON'S EXHIBIT. 64-13.

500

Speaking Telephone

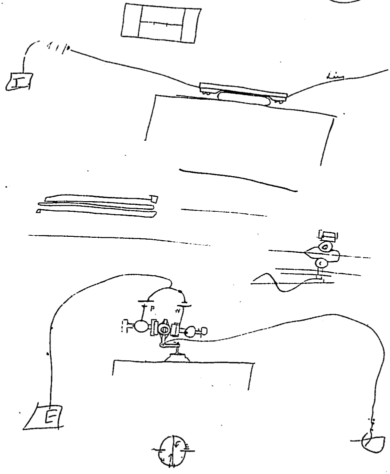
Nov 5 1877
T A Edison
James Adams



EDISON'S EXHIBIT. 65-13.

Spkg Telephone

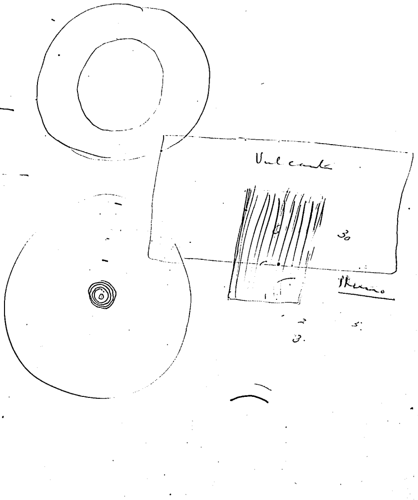
Nov 5 1877
T A Edison
Chas Batchelor



503

Speaking Teleg

Nov 5 1877
T A Edison
Chas Batchelor


Vulcanite
30
2
3.
5

5 5 5 6 5 5

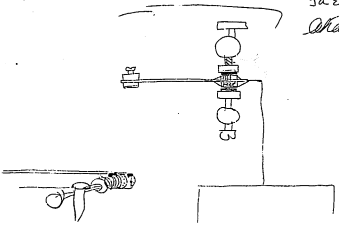
45 40 35 30 25 20 | 5

EDISON'S EXHIBIT. 67–13.

504

Spkg Telegh

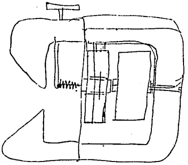
Nov 5th 1877
T A Edison
Chas Batchelor

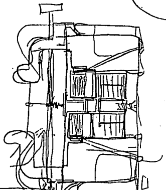


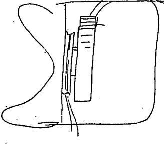
EDISON'S EXHIBIT. 68–13.

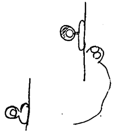
Speaking Telegraph

Nov 5 1877
T A Edison
Chas Batchelor
James Adams



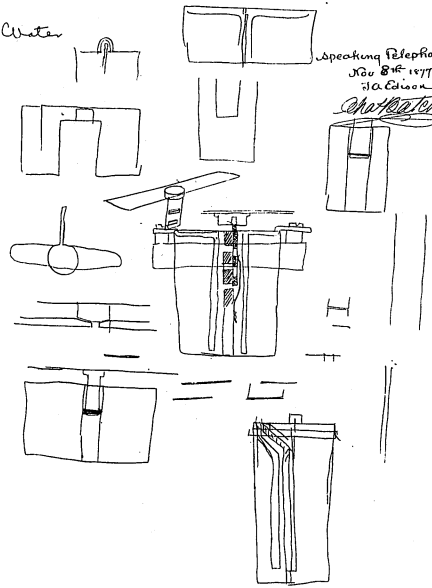






586

506

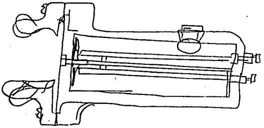

Water
Water

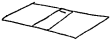
Speaking Telephone
Nov 8th 1877.
T A Edison
Chas Batchelor

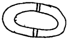
EDISON'S EXHIBIT. 70-13.

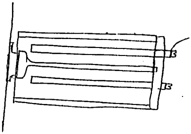
Speaking Telegraph

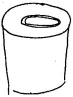
Nov 8 1877
T A Edison
Chas Batchelor

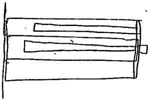












EDISON'S EXHIBIT. 71-13.

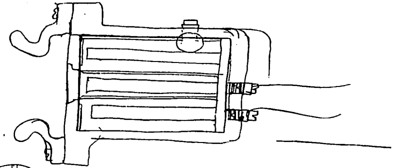
508

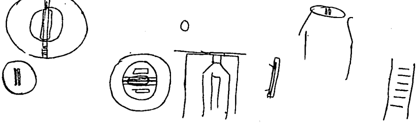
Speaking Telegraph

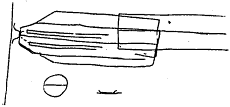
November 8 1877.

T.A. Edison

Chas Batchelor







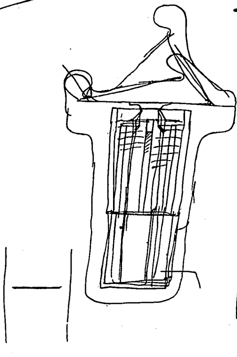
EDISON'S EXHIBIT, 72-13.

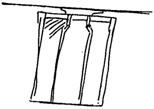
Speaking Telegraph

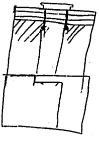
November 8 1877.

T A Edison

Chas Batchelor







EDISON'S EXHIBIT. 73-13.

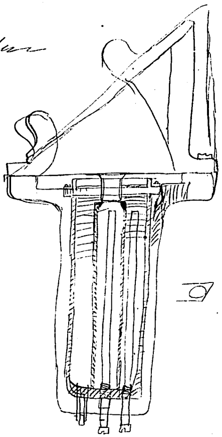
Expty Platinum

H_2Cl

Nov 8 1879

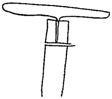
T A Edison

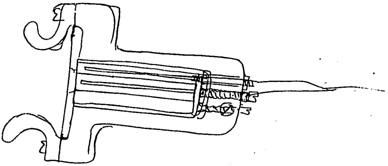
Chas Batchelor



EDISON'S EXHIBIT. 74-13.

Nov 8 1877
T A Edison
Chas Batchelor



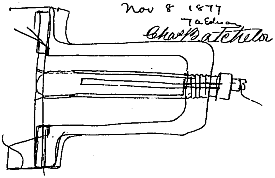


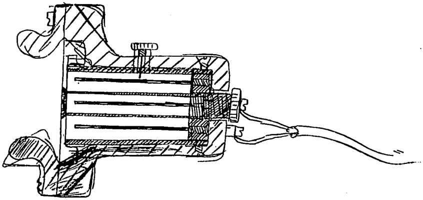
EDISON'S EXHIBIT. 75-13.

511

Spkg Telephone

Nov 8 1877
T A Edison
Chas Batchelor





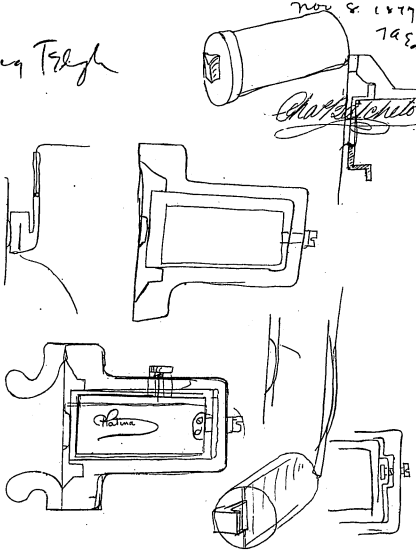
378

Aut Telegh

Nov 8 1877

T A Edison

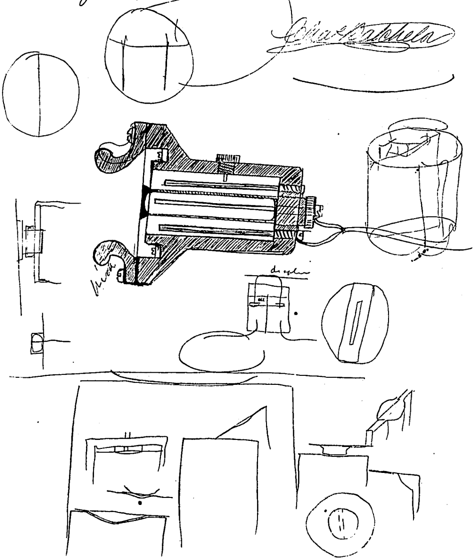
Chas Batchelor



EDISON'S EXHIBIT. 77-13.

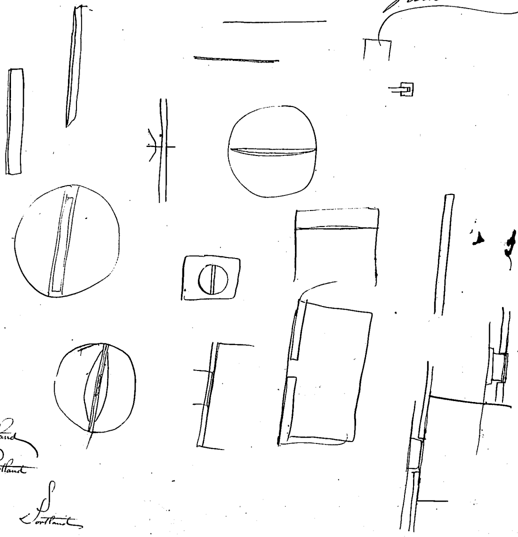
Speaking telegraph Nov 8th 1877

Chas Batchelor



Speaking Telephone

Nov 10 1877
T A Edison
Chas Batchelor
James Adams



Portland
Portland
Portland

EDISON'S EXHIBIT. 79-13.

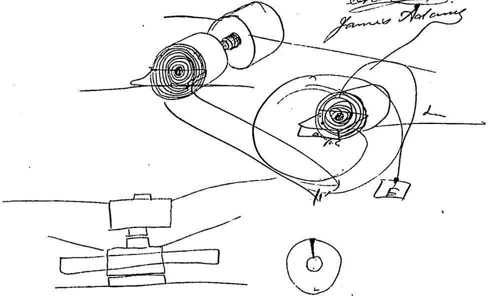
518

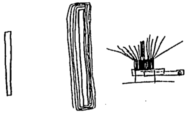
Speaking Telephone

Curious method.

Nov 10 1877
T A Edison

Chas Batchelor
James Adams





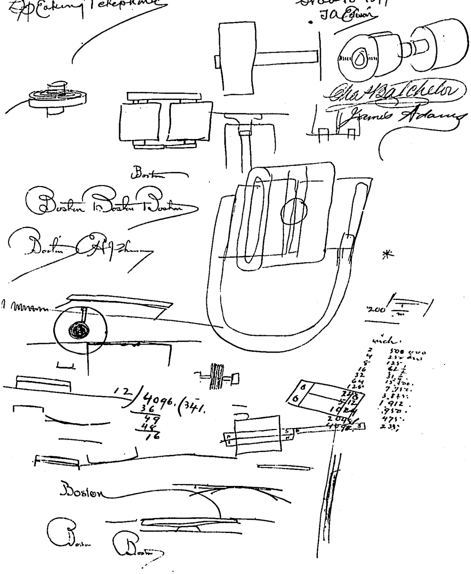
EDISON'S EXHIBIT. 80-13.

519

Talking Telephone

Nov 10 1877
T A Edison

Chas H Batchelor
James Adams



Boston

Boston Boston Boston

Boston

Boston

Boston Boston

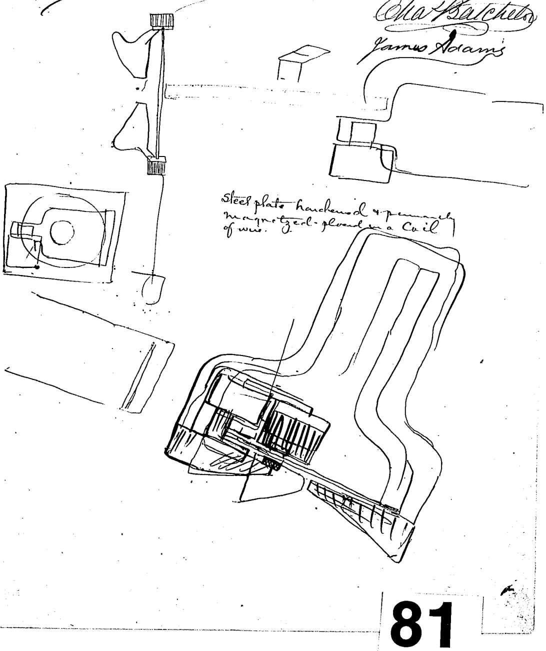
12) 4096. (341.
36
49
48
16

200

inch.	
2	500
4	250
8	125
16	62 1/2
32	31 1/4
64	15.700.
128	7.712.
256	3.875.
512	1.912.
1024	.950.
2048	475.
4096	239.

Spkg Telephone

Nov 10 1877
T A Edison
Chas Batchelor
James Adams

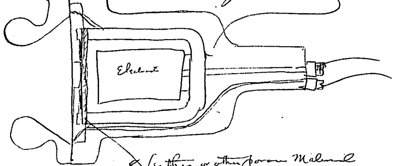


Steel plate hardened & permanently magnetized - placed in a Coil of wire.

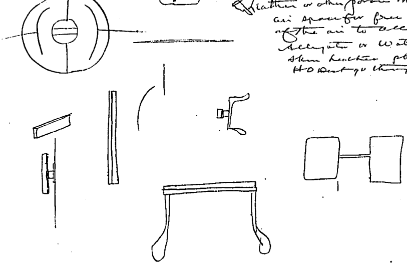
EDISON'S EXHIBIT. 82–13.

Speaking Telephone

Nov 10 1877
T A Edison
Chas Batchelor
James Adams



Leather or other porous Material
air space for free circulation
of the air to allow evaporation
Alligator or Water animal
skin leather probably best as
H O dont go through so quick

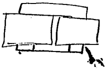


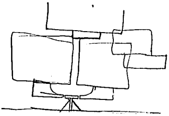
Spkg Telephone

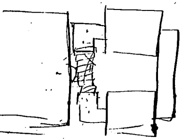
Nov 10, 1877

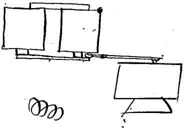
Chas Batchelor

James Adams









Boston

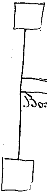
Boston

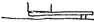
Boston

Boston

Boston

Boston





Boston

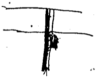
Boston,,

Boston Boston Boston

Boston

Boston

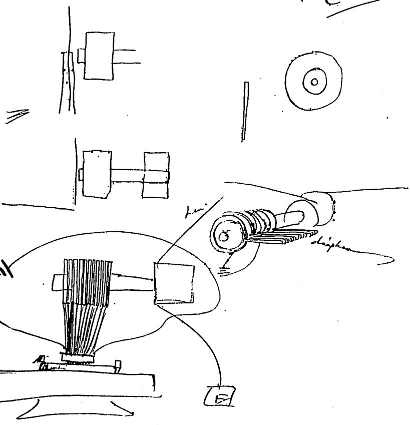
Boston



EDISON'S EXHIBIT. 84-13.

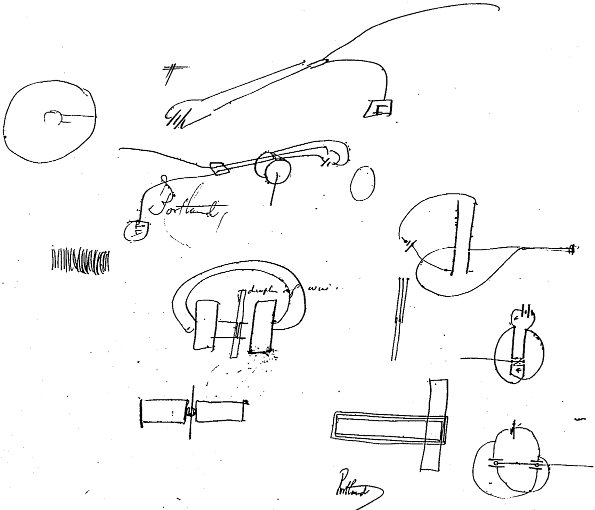
recording Telegraph

Nov 10 1877
T A Edison


line
diaphm

Spkg Telegh

Nov 10 1877
TAEdison


Portland
duplex of wire

Portland

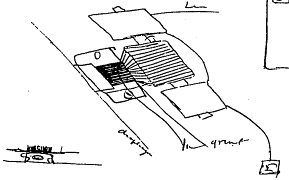
Portland Portland Portland

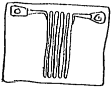
EDISON'S EXHIBIT. 86–13.

Speaking Telegraph

Nov 10 1877
T.A. Edison

Boston Boston

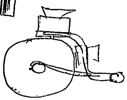


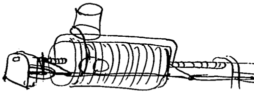


Silver on glass.

Boston Portland

Portland,



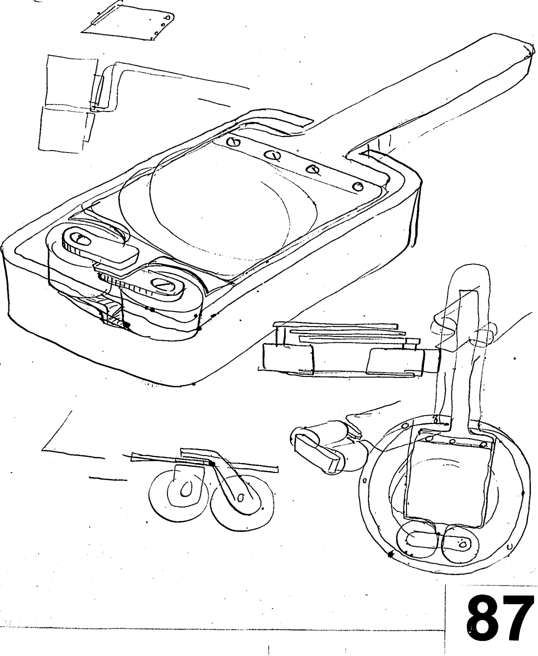


20.

Phonograph. tissue ppr & tin foil over it 10 thds to inch on Cylinder

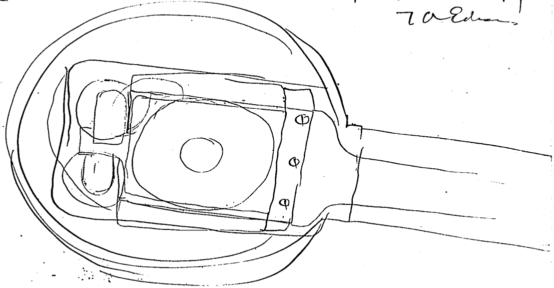
Spkg Telegh

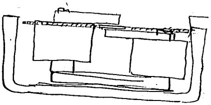
Nov 10 1877
T A Edison



Stel

Nov 10 1877
T A Edison

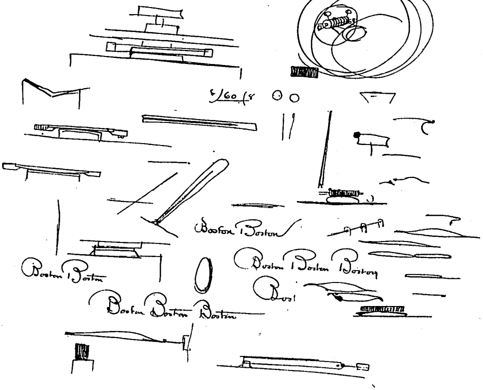




EDISON'S EXHIBIT. 89-13.

Speaking Telegh

Nov 10 1877
T A Edison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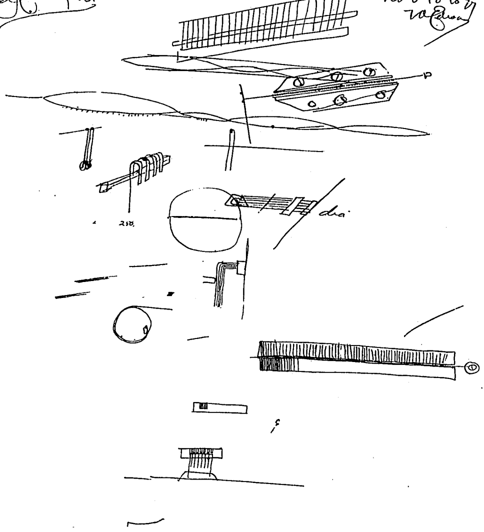
Boston Boston Boston

EDISON'S EXHIBIT. 90-13.

Nov 10 1877
TA Edison

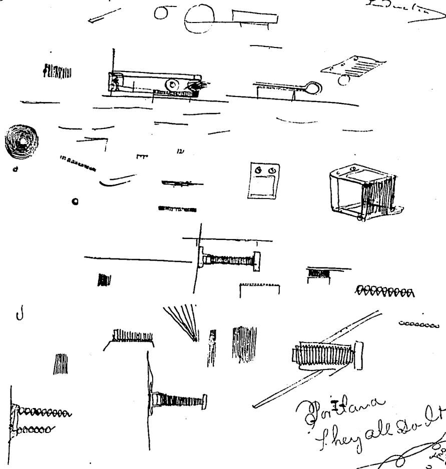


EDISON'S EXHIBIT. 91-13.

Dplx Telegraph

Nov 10 1877
T A Edison

Varying Resistance in local clct & why main line by Induction



Portland
They all do it

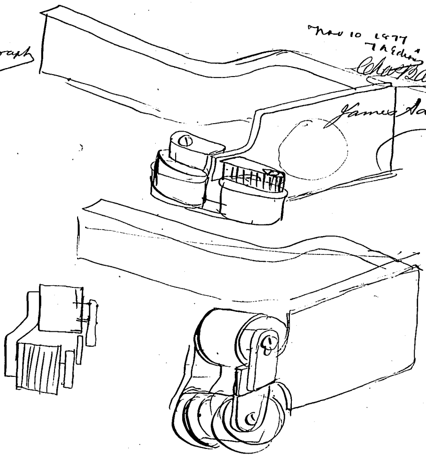
523

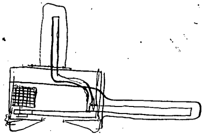
Spkg Telegraph

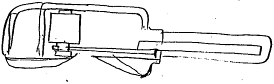
Nov 10 1877
TA Edison

Chas Batchelor

James Adams



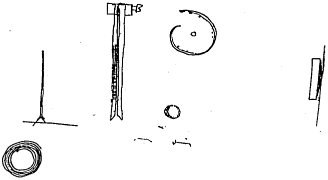


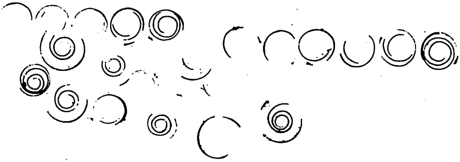


EDISON'S EXHIBIT. 93-13.

Speaking Telegraph

Nov 10 1877
T A Edison





EDISON'S EXHIBIT. 94-13.

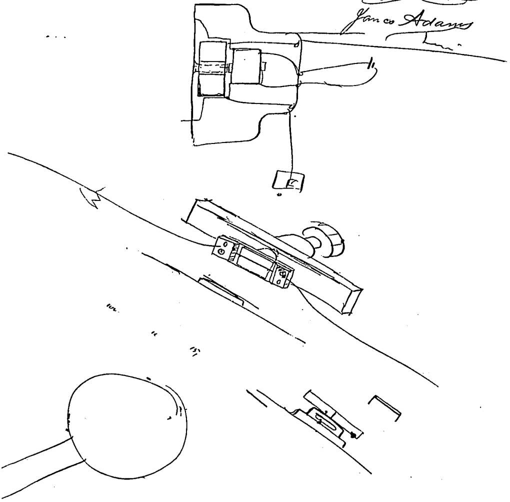
Speaking Telephone

Nov 10 1877

T A Edison

Chas Batchelor

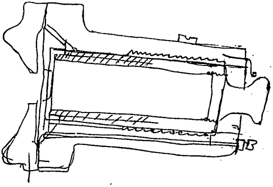
James Adams



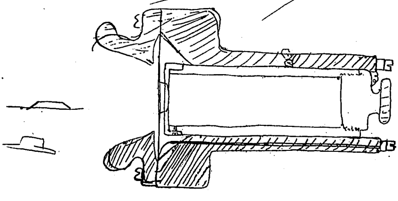
EDISON'S EXHIBIT. 95-13.

Nov 10. 1877

Chas Batchelor



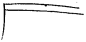
Portland Portland

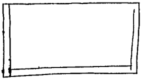


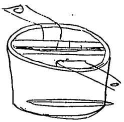
EDISON'S EXHIBIT. 96-13.

eaking Telephone

Nov 10 1877
T A Edison
Chas Batchelor
James Adams





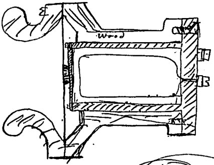


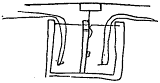
250.

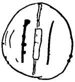
1800.

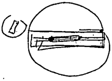
.500.
5000

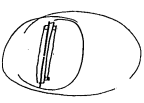
50.

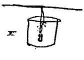






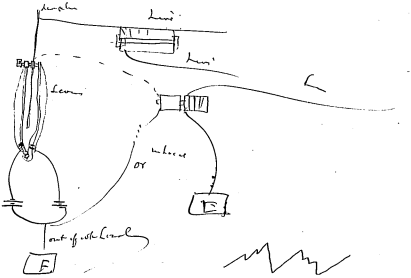






Speaking Telegraph

Nov 12 1877
T A Edison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or
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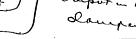
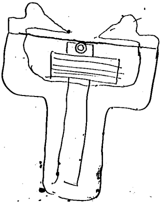




Bell.
Impt in articulation dampened diaphragm

Rubber tubing in end of perm mag

EDISON'S EXHIBIT. 98-13.

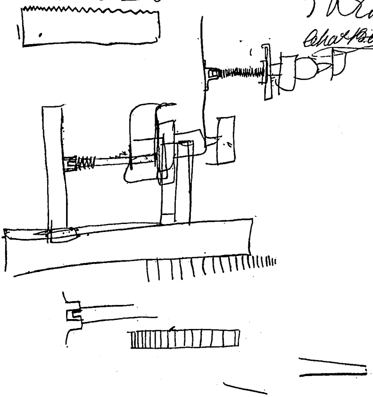
528

Spkg Telegh

Nov 12 1877

T A Edison

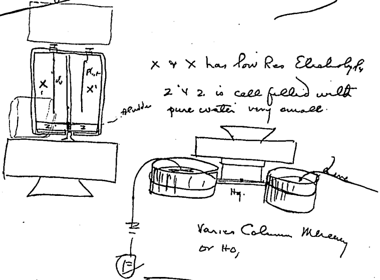
Chas Batchelor



EDISON'S EXHIBIT. 99-13.

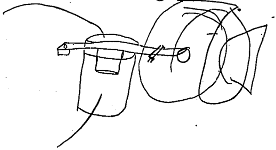
Speaking Teleg

Nov 12 1877
TA Edison


X
Zn
Plat
X'
Z'
Z
bladder
Hg.
Line

x & x has low Res Electrolyte
Z' & Z. is cell filled with pure water very small.

Varies Column Mercury or H_2O,

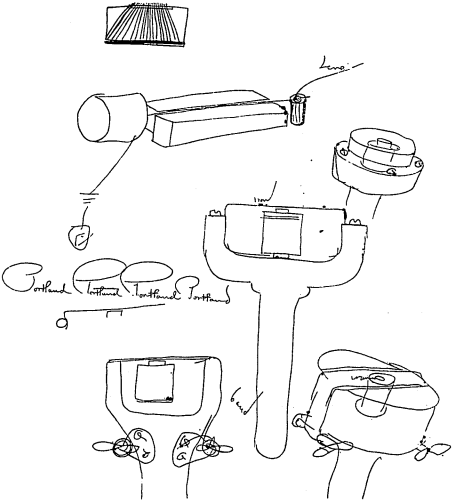


EDISON'S EXHIBIT. 100-13.

531

Speaking Telegraph

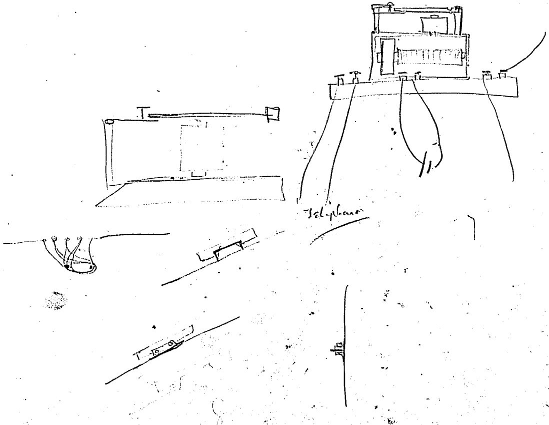
Nov 12 1877
T A Edison


Lens
iron
Portland Portland Portland Portland
band
iron

533

Nov 12 1877
TA Edison

Dplx Relayphone

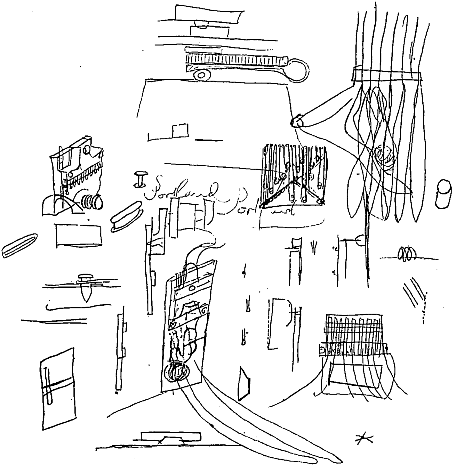


EDISON'S EXHIBIT. 102-13.

Nov 12 1877

T A Edison

Chas Batchelor

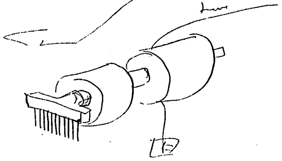

Portland
Portland

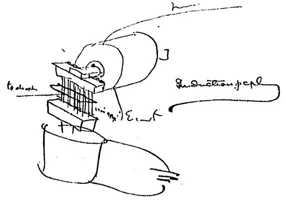
EDISON'S EXHIBIT.103–13.

Nov 12 1877

T A Edison

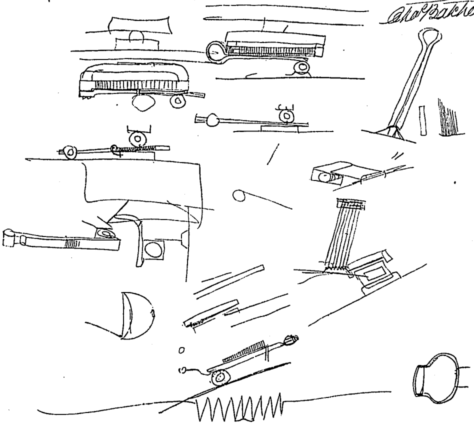
Spkg Telegh



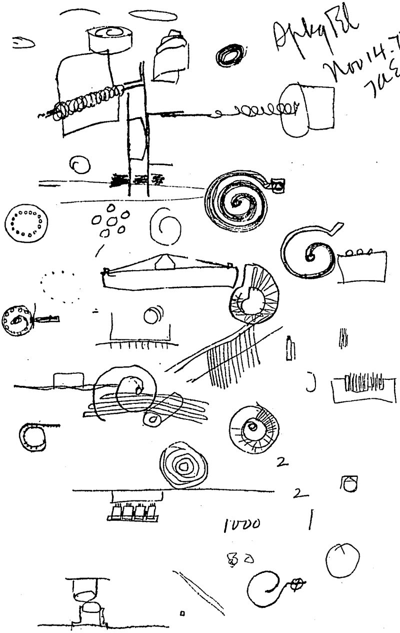

line
to diaph
Induction paper
Earth

Nov 12 1877
T A Edison
Chas Batchelor

Spk

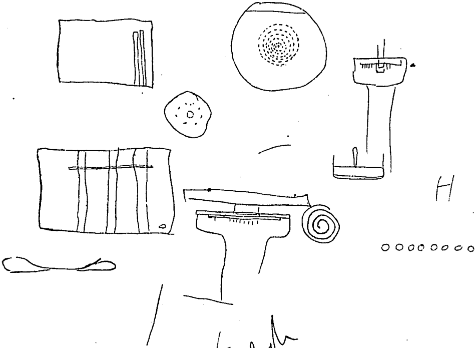


EDISON'S EXHIBIT. 105-13.



Spkg Tel
Nov 14.77
TAE

538

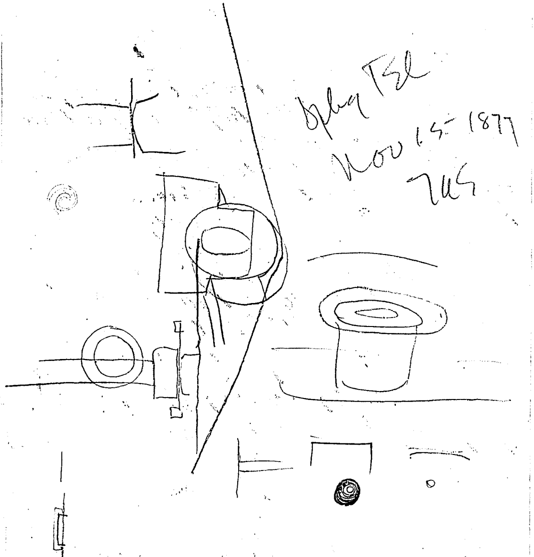


Spkg Teleph

Nov 14 1877

TAE

James Adams



Spkg Tel
Nov 15 1877
TAE

EDISON'S EXHIBIT. 108–13.

540

Speaking Teleg

Nov 15 1877

TA Edison

60
6
360,
12) 360,
30,

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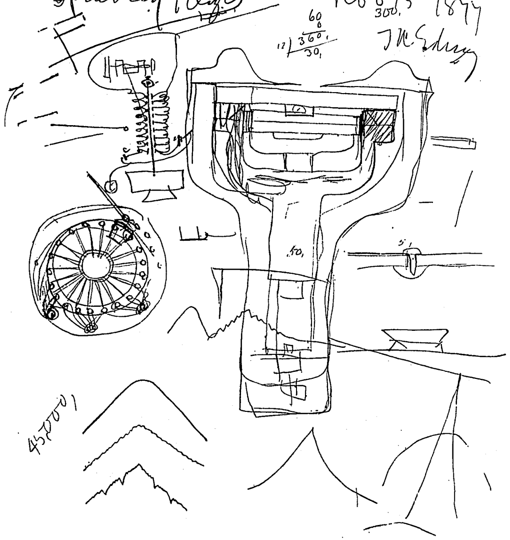
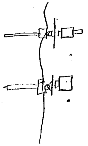


new Idea
Spkg Telephone —

Nov 16 1877
T A Edison



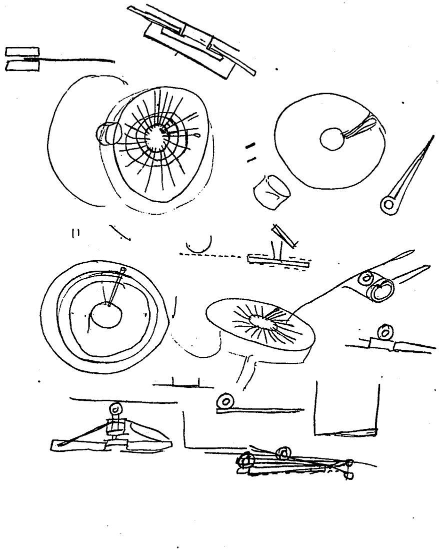
not good. Idea was to get rid induction between & telephone wires

EDISON'S EXHIBIT. 110-13.

Speaking Telegraph

Nov 16th 1877

Chas Batchelor



546

Br Reg Teleph

Nov. 16. 1877
T A Edison

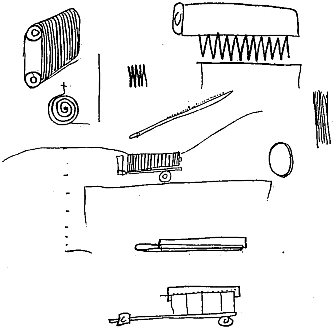
Found that in Bells telephone a Copper or Mica diaphragm could be used in transmitter in place of iron. Wherefore how does it work deponent sayeth not except that the vibration of diaphragm disturbs the molecular quietness of the permanent magnet hence currents — we are now making a number of experiments to devise a telephone based on the molecular disturbance of a permanent Mag or Electromagnet. We find that words spoken in a Bell telephone is received with $\frac{1}{2}$ the loudness ~~of~~ in the Copper diaphragm apparatus that they would if there was an iron diaphragm — this is a new advance in the art — hence patentable & gets clear of Bells broad claims

EDISON'S EXHIBIT. 112-13.

545

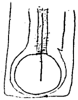
Phng Telephone

Nov 16 1877
T A Edison



Apleg Telegh

Nov 16 1877
TA Edison



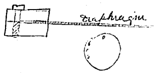
EDISON'S EXHIBIT. 114–13.

548

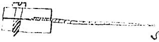
Speaking telegraph
Sunflower pattern Nov 14th 1877

Chas Batchelor

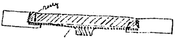
To fasten diaphragm & bind all round



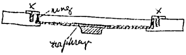
Two flat rings with diaphragm clamped in between leaving plenty of room for screws outside of edge of plate



Same but top plate recessed 3/4 thickness of plate



Diaphragm recessed into frame and a ring screwed into ring & tightened up on the diaphragm. This would be sure to bind all over



Diaphragm let in from back and ring put in afterwards edgeways, this is clamped against diaphragm by screws all round as at X X

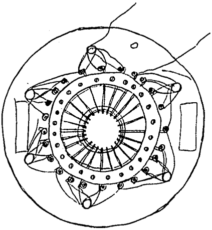
EDISON'S EXHIBIT. 115-13.

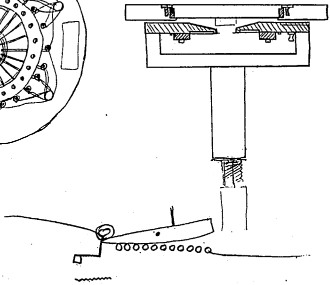
544

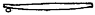
Speaking Telegraph
Nov 14 1877

T A Edison
Chas Batchelor
James Adams

Sunflower







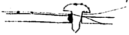
EDISON'S EXHIBIT. 116-13.

347

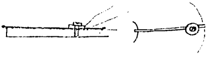
- Talking telegraph
Nov 17th 1877

Chas Batchelor

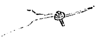
Methods of Clamping vibrating springs on Sun flower telephone
Springs made of hair spring



Spring bent on end and pin wedged in hole with it.

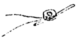


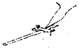
Spring held by loose washer and clamping screw



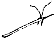
Spring soldered to collar & held in place by screw

Spring laid in slot in a washer and tightened when screwed down upon





Cross bar with 2 spikes



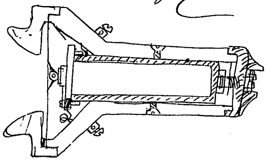
small staple

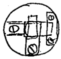
EDISON'S EXHIBIT. 117–13.

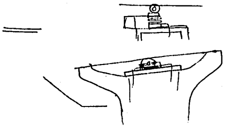
52√

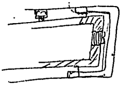
Spkg Telegraph

Nov 19 1877
T A Edison
Chas Batchelor
James Adams



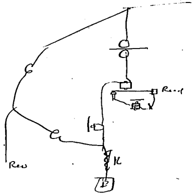


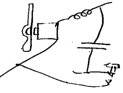


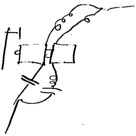


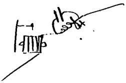
Nov 19 1877.
T.A. Edison

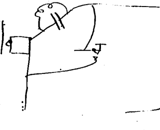
Coushe = Morse

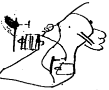


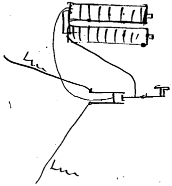


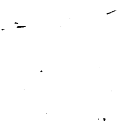


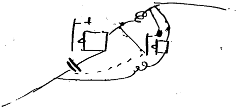






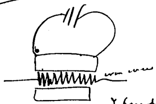




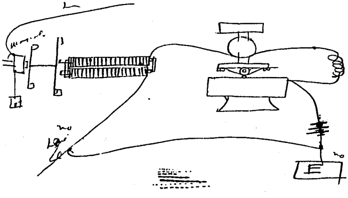


EDISON'S EXHIBIT. 119–13.

Spring Relay Nov. 19. 1877



I find that stretching this iron wire within the helix that helix which is already hot becomes hot + cold (ie) hot & less hot =

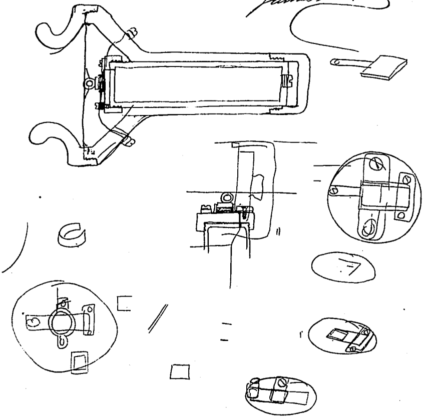


EDISON'S EXHIBIT. 120–13.

Nov 19 1877

Speaking Telephone

Chas Batchelor
James Adams

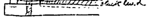


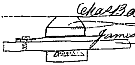
EDISON'S EXHIBIT. 121-13.

552

Speaking telegraphy
Nov 19th 1877

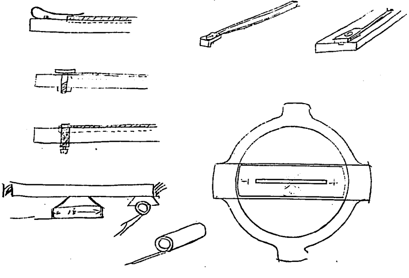
Nov 20 1877
TAE.
Chas Batchelor
James Adams





Clamp & hold lead in pencil telephone

cut groove for pencil to slide in



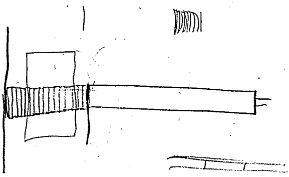
553

Spkg Teleph

Nov 20 1877

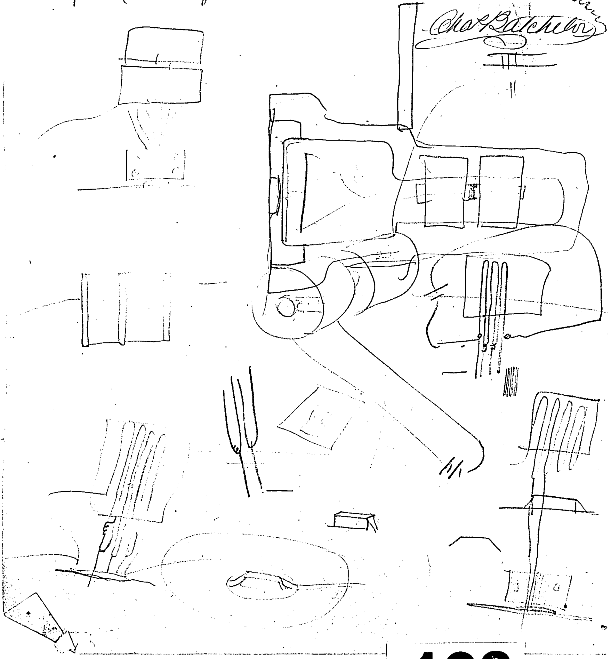
T A Edison

Chas Batchelor



Spkg Telegh

Nov 20 1877
TA Edison
Chas Batchelor



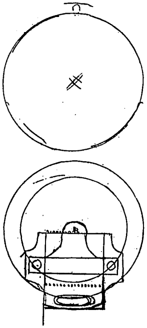
EDISON'S EXHIBIT. 124–13.

Spkg Telegh

Nov 20 1877

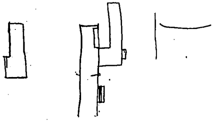
T A Edison

Chas Batchelor
Nov 20



16/100

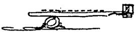
2|1000
8|500
60



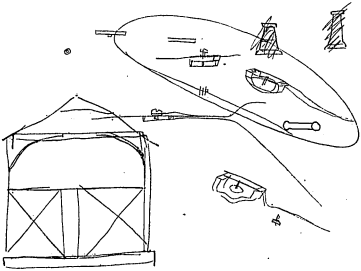
EDISON'S EXHIBIT. 125–13.

Spkg Telegh
Nov 20 1877
TA Edison
Kreusi =
Chas Batchelor Nov 20

Alterations, put reed lever on the piece like the one you put on the wire spool



Batchelor

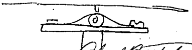


EDISON'S EXHIBIT. 126-13.

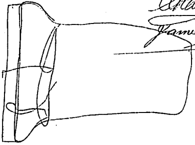
557

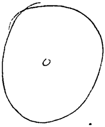
Speaking Telegraph

Nov 21 1877
TA Edison

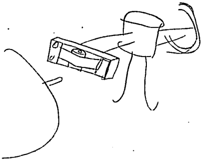


Chas Batchelor
James Adams





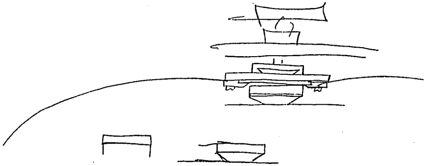
Rubber Shouldered



EDISON'S EXHIBIT. 127-13.

Speaking Telegraph

Nov 21 1877
TA Edison
Chas Batchelor

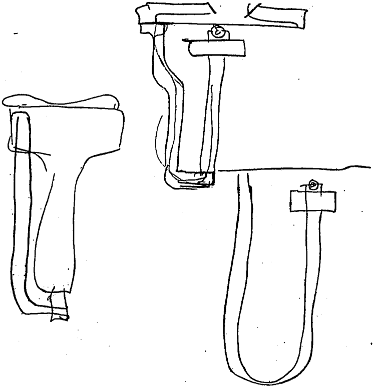


EDISON'S EXHIBIT. 128-13.

561,

Copying Telegraph

Nov 21 1877
T A Edison
Chas Batchelor



10 Cell Moist battery

Put up Nov 21 1877 Chas Batchelor

Tests Bradley Galv No 24

1877		1	2	3	4
Nov 21st	10 AM	79	67	28	4
	4 PM	79	67	28	4

this was on short circuit

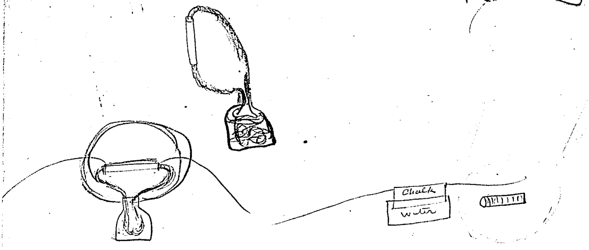
Nov 21st 4 PM put on 2000 ohms steady

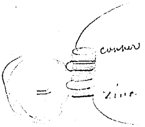
1	2	3	4
43	16	3	$\frac{1}{2}$

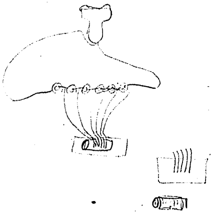
Speaking Teleg.

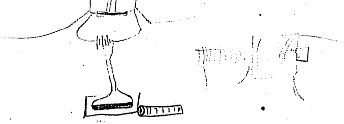
Nov 22d 1877

Adams


Chalk
Water


copper
zinc

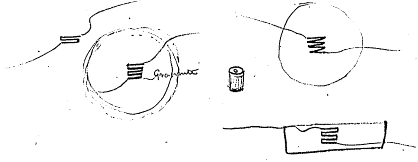


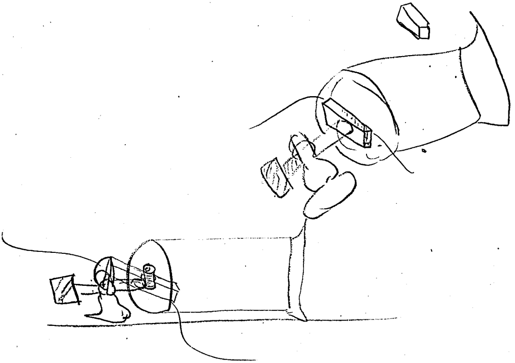


Speaking telegraph

Nov 22d 1877

Adams



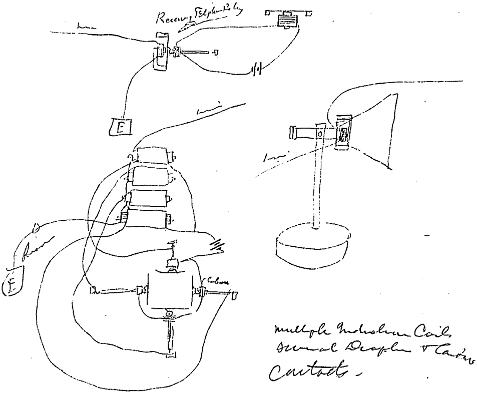


EDISON'S EXHIBIT. 130–13.

502

Nov 22 1877
TA Edison

James Adams

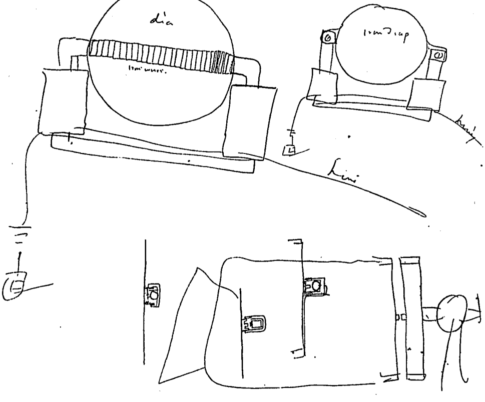

Local Receiver
Receiving Telephone Relay
line
E
line
Rec
E
Carbon
line

multiple Induction Coils
several Diaphs & Carbon
Contacts -

EDISON'S EXHIBIT. 131–13.

Speaking Telegraph

Nov 23 1877
T A Edison
Chas Batchelor
James Adams

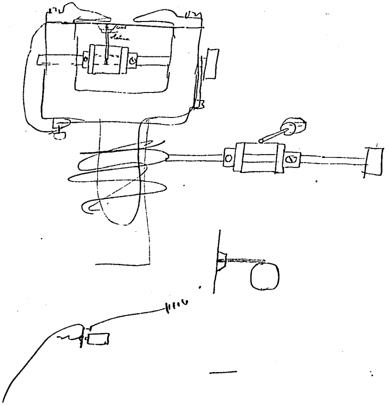

dia
Iron wire.
Iron Diap
Line
Line

EDISON'S EXHIBIT. 132—13.

563

Apply Pat

Nov 23 1877
T A Edison

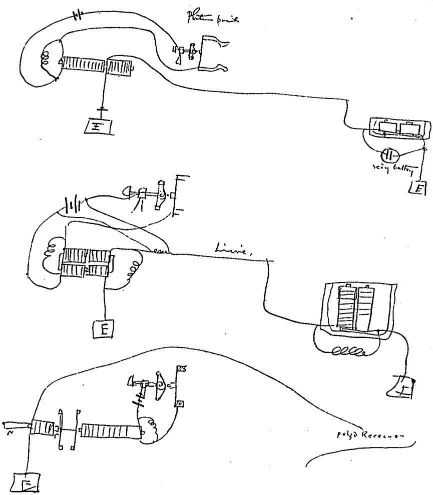

carb
platina

EDISON'S EXHIBIT. 133-13.

565

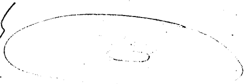
Speaking Telegraph

November 28 1877
T A Edison
Chas Batchelor

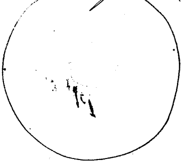

Platina point
E
seiz battery
E
Line,
E
E
N
polzd Receiver
E

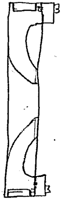
10

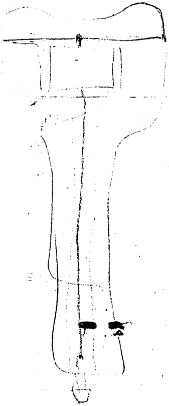
Spkg Telg

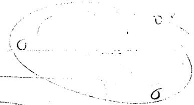


Nov 23
1877
TA Edison
James Adams





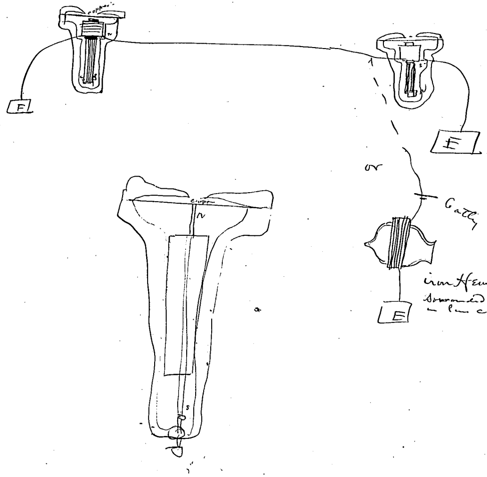




567

Spkg Telegh

Nov 23 1877
T A Edison
Chas Batchelor

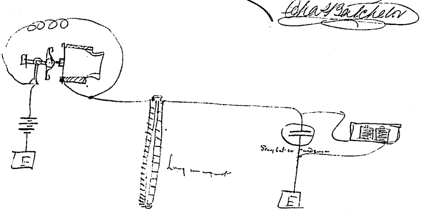

copper
N
E
S
E
or
Batty
E
copper
N
S

iron Hemholtz Resonator surrounded with wire in line ckt.

EDISON'S EXHIBIT. 136-13.

Speaking Telegraph

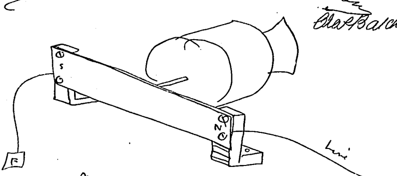
Nov 23 1877
T A Edison
Chas Batchelor


6000
E
Long magnet
Storage battery condenser
E

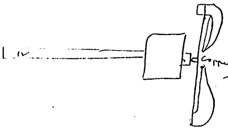
EDISON'S EXHIBIT. 137-13.

Spkg Telegraph

Nov 23 1877
TA Edison
Chas Batchelor



Molecular disturbance generates Currents



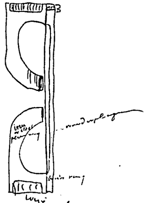
Copper point hits end of permanent magnet & sends currents by Molecular disturbance

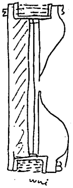
EDISON'S EXHIBIT. 138–13.

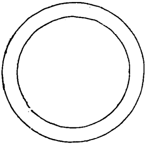
569

Spkg Telegraph

Nov 23 1877
TA Edison
Chas Batchelor


3
iron or steel perm ring
wood diaphragm
brass ring
wire in bucket wound around.

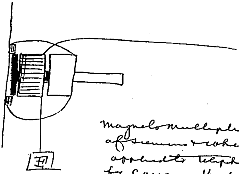




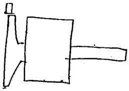
EDISON'S EXHIBIT. 139-13.

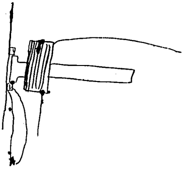
Speaking Telegraph

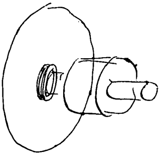
Nov 23 1877
T.A. Edison



Magneto multiplication of Siemens & Wheatstone applied to telephony for causing the human voice to generate its primary magnetization to allow of induction currents being generated,



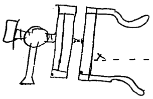




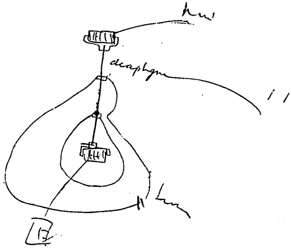
EDISON'S EXHIBIT. 140-13.

Speaking Telegraph

Nov 23 1877
T A Edison



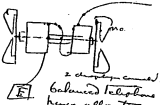
x mica diaphgm to prevent heat Effecting iron diaphram in front


line
diaphgm
line

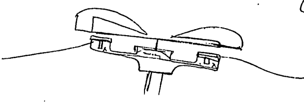
EDISON'S EXHIBIT. 141–13.

Speaking Telegraph

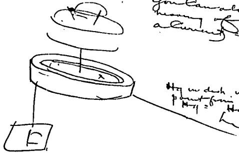
Nov 23 1877
T A Edison



2 diaphragms connected together
balanced telephone
hence allow to work
closer tuning & have
double power



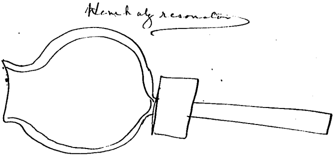
m.x. a Chem Sol working a
diaphragm by the capillary
Electromotive principle.
you can also send as the
moving of mercury produces
a current

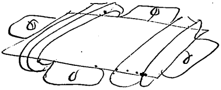


Hg in dish within a Coil.
point from diaphragm dips in
Hg = Hg has lost its iron dissolved
in it by use of sodium amalgam
The waves given the
mercury by point from
diaphragm sets up
induced Currents,

Speaking Telegraph

Nov. 23 1877
T A Edison

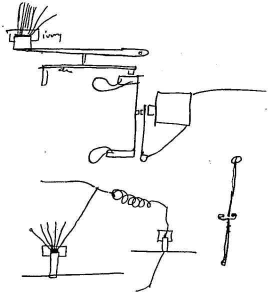

Helmholz resonator

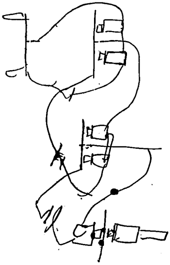


EDISON'S EXHIBIT. 143-13.

Speaking Telegraph

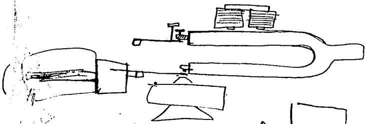
Nov 23 1877
T A Edison





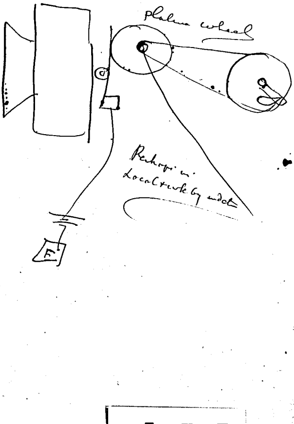
Speaking Telegraph

Nov 24 1877
T. A. Edison



150
50
7500

60
20
1200

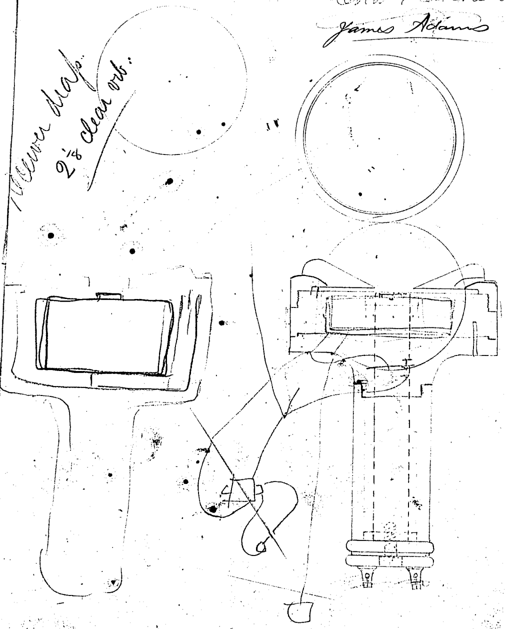

Platina wheel
Perhaps in Local circuit by induct
F

Ring Telegraph

Nov. 24 1877

Chas Batchelor

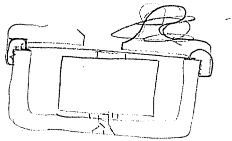
James Adams



Receiver diaph: 2 1/8 clear out:

Hyley T Sleigh

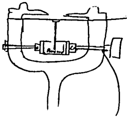
Nov 25 1877
TAEdison



EDISON'S EXHIBIT. 147-13.

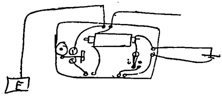
Talking Telegraph

Nov-26 1877
T A Edison



EMG Receiver

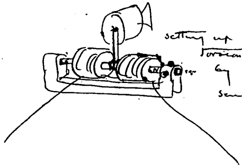
This works red hot



EDISON'S EXHIBIT. 148–13.

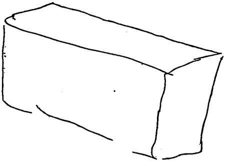
Speaking Telegraph

Nov 26 1877
T A Edison



setting up induction Currents by torsion of the permanent magnet by the diaphragm

Sending & Receiving same

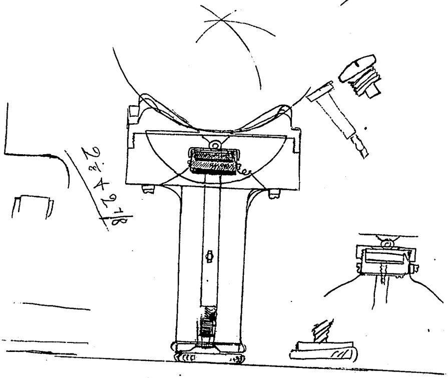


EDISON'S EXHIBIT. 149-13.

576 Speaking telegraph

Nov. 26th 1877

Chas Batchelor
James Adams

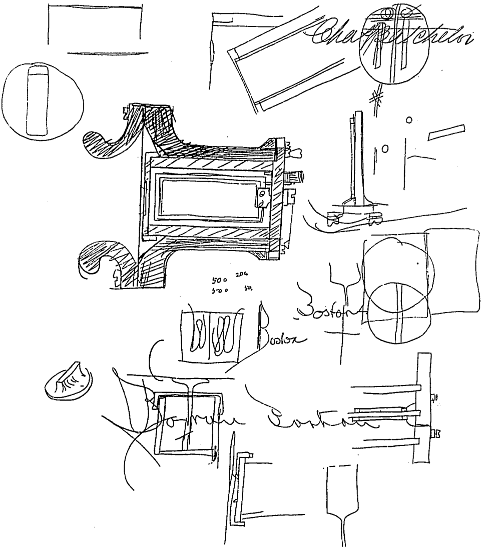


EDISON'S EXHIBIT. 150-13.

579

Speaking telegraph

Nov 26 1877

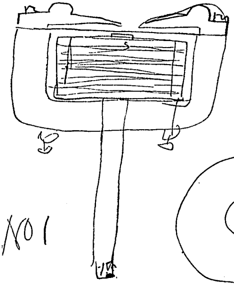

Chas Batchelor
500 200
500 50
Boston
Boston
Boston

EDISON'S EXHIBIT. 151–13.

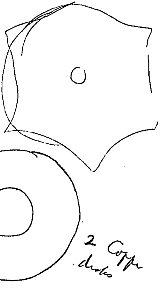
578

Speaking Telegraph

Nov 26 1877
T. A. Edison
Chas Batchelor



No 1



2 Copper discs

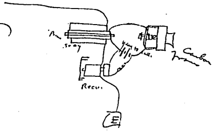
= = thickness

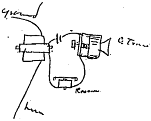
EDISON'S EXHIBIT. 152-13.

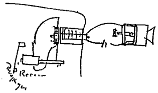
Speaking Telegraph.

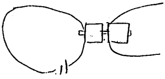
Nov 26 1877
T A Edison
Chas Batchelor

Same other End


Carbon Trans
Recvr
E


Ground
C Trans
Recvr
line



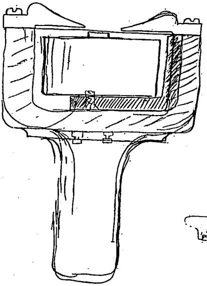


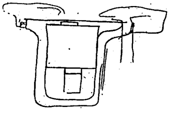
EDISON'S. EXHIBIT. 153-13.

Speaking Telegraph.

Nov 28th 1877

Chas Batchelor





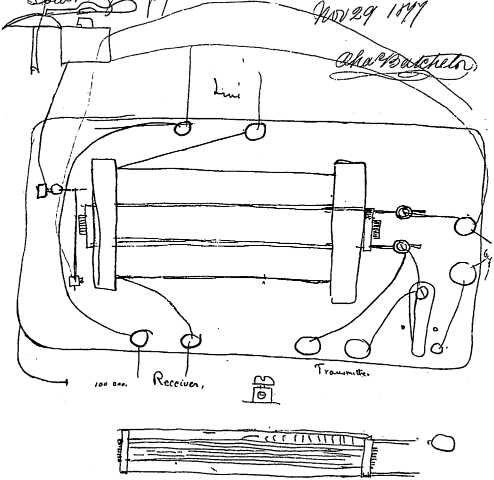
EDISON'S EXHIBIT. 155-13.

584

Speaking telegraph

Nov 29 1877

Chas Batchelor


Line
Gr
100 000.
Receiver,
Transmitter

800.

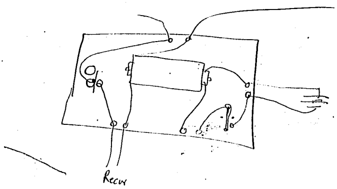
100.

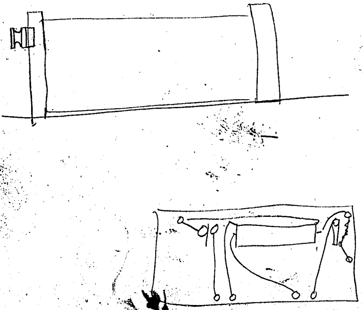
20 000

565
4 Speaking telegraph

Nov 29 1877

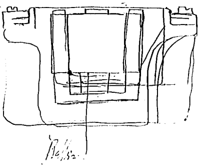
Chas Batchelor

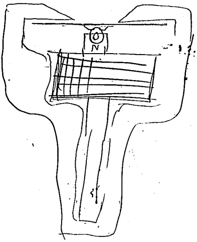




Speaking Phonograph

Nov 29 1877
T A Edison
Chas Batchelor





EDISON'S EXHIBIT. 158–13.

30 Murray 4 hrs
31 " 14 "
18

10
17
18
15
12
8
12
4
2
2
2
2
2 75
6
1 50
8
7 50
4 00
2 00
7 00
10 00
6
10
7
17
15

207 75

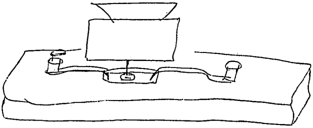
EDISON'S EXHIBIT. 158—13.

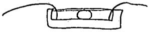
		hours		
Nov 1	Telephone	14 "		
2	"	16 "		
3	Lamp Black Mould			
"	Cash to Edison	12 x		$1.00
4	Lamp Black Mould	4		
"	Cash to Edison			80¢
5	Murray telephone	9		
6	" "	12		
7	" "	10		
8	" "	10		
"	Sheet Steel & Iron			85¢
9	Murray telephone	12		
10	" "	10		
11	telephone	6		
12	"	10		
13	" Experiment	10		
14	" "	10		
~~15~~	~~"~~		132	
15	"	10		
16	" "	10		
17	" "	10		
18	" "	4		
19	" "	10		
20	" "	10		
21	" "	10		
22	" "	12		
23	" "	11		
24	Resonator	10		
25	"	8		
26	telephone Exper	11		
27	"	13		
28	"	9		
30	"	10		
		148		
		x 12		
				160 hours

EDISON'S EXHIBIT. 159-13.

Spkg 584 Telegraph

Dec 2. 1877
T A Edison

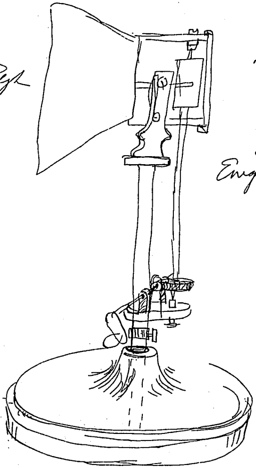




EDISON'S EXHIBIT. 160-13.

587

Spkg Phgh



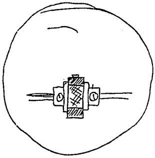
Dec 3 1877
T A Edison
Chas Batchelor
James Adams

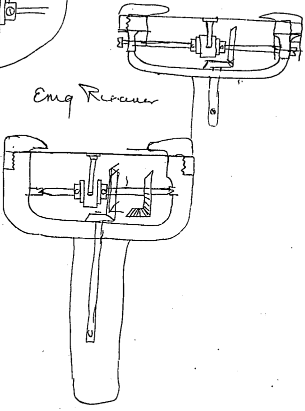
Eng Receiver

EDISON'S EXHIBIT. 161-13.

Speaking Telegraph

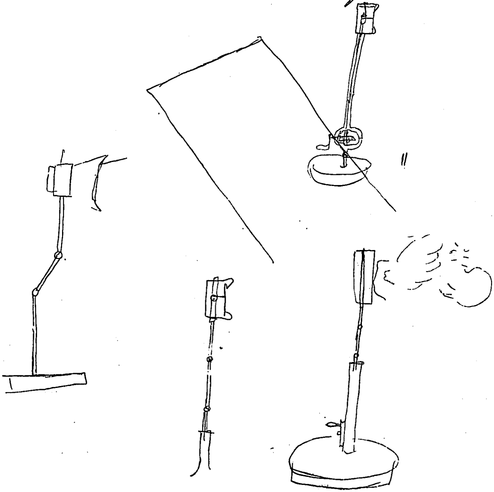
Dec 3 1877.
T A Edison
Chas Batchelor
James Adams




Emg Reciever

Speaking Telegraph

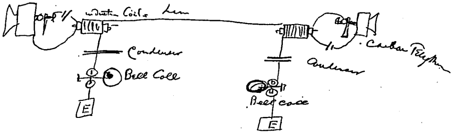
December 3 1877
T A Edison
Chas Batchelor
James Adam.

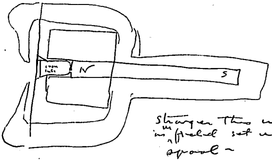


EDISON'S EXHIBIT. 163-13.

Speaking Telegraph

Dec 3 1877
T A Edison
Chas Batchelor
James Adams


induction Coils
Line
Condenser
Bell Coil
E
Carbon Telephone
Condenser
Bell coil
E


iron tube
N
S

Stronger this way in m field set up under spool ~

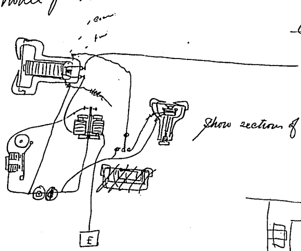
EDISON'S EXHIBIT. 164-13.

Speaking telegraph

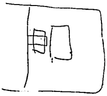
Model for P.O.

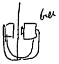
Dec 4 1877

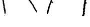
Chas Batchelor



Show section of trans. & rec.



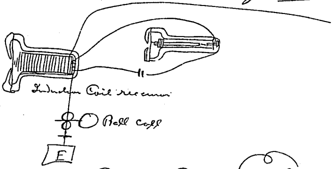




593

Speaking Telephone

Dec 4 1877
T A Edison
Chas Batchelor
James Adams


Induction Coil receiver
Bell call
E

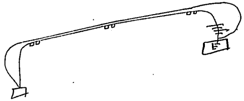
Bell Call Call Eighty First
Twenty Twenty
Twenty Fourth
Fourth Thirty third

EDISON'S EXHIBIT. 166–13.

174.

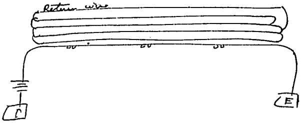
Spkg Telegraph

Dec 4 1877
T A Edison
Chas Batchelor
James Adams



any resistance in the groundwire will cause induction or leakage in the Telephone wire,

Idea to prevent =

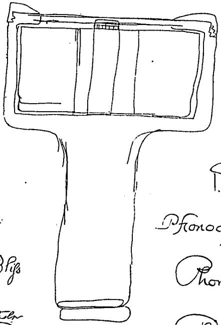


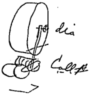
EDISON'S EXHIBIT. 167-13.

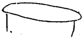
59

Speaking Telegraph

Dec 7 1877
T A Edison
James Adams







Portland

Portland
Maine Oregon

Phonograph

George H Bliss

Phonograph

Batchelor Batchelor
Batchelor

Batchelor Batchelor
Phonograph

Chas Batchelor
Batchelor
Phonograph Company
Chas Batchelor
Company
The Phonograph Company
Batchelor
Batchelor
Batchelor

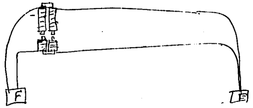
Batchelor Batchelor

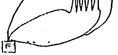
EDISON'S EXHIBIT. 168-13.

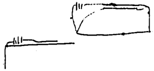
Compensating

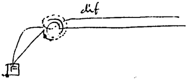
Dec 7/ 18 77

The Compensation may even be in the helices of the signalling inst instead of the line. of Course the principle being Curing one Evil by another Similia similibus Curantur it may be Carried out in numerous ways.









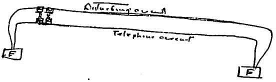
EDISON'S EXHIBIT. 169-13.

Speaking Teleg   Dec 7

1877

T A Edison

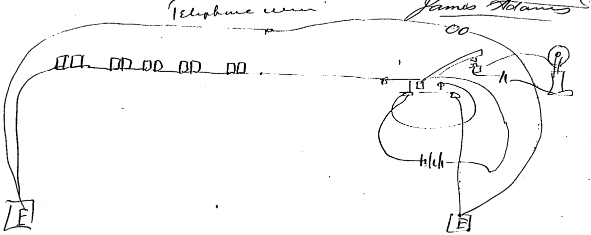
Idea occurred to me that the plan I thought
of for Compensating for sympathy on Quadline
from Pitts to Chicago several months
ago would be just the thing for
destroying the Extra noises on a Telephone
wire. Tried Experiment today in New York
on a telephone wire to 23rd st from 198
Brdway placed one magnet in a disturbing
circuit facing a similar magnet in
the telephone ckt on working disturbing
circuit induction due to proximity of wire
outside was neutralized by the induction
of the magnets when in a particular
adjustment Thus

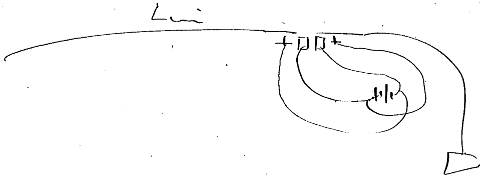


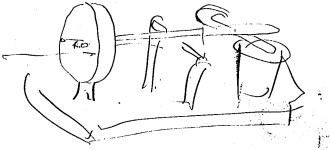
597

Compensator

Dec 7 1877
T A Edison
James Adams

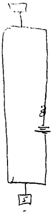

Telephone wire
E
E

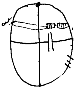


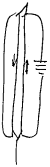


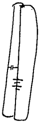
Compensation

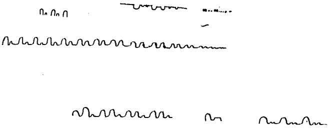
Dec 7 1877
TAEdison
James Adams

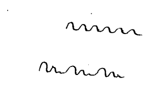








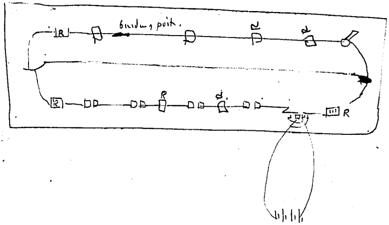




579 -

Compensation

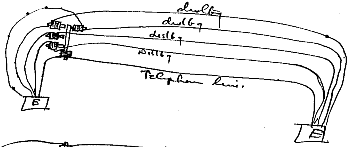
Dec 7 1877
T A Edison
James Adams


R
binding post.
2
d
R
R
d.
R

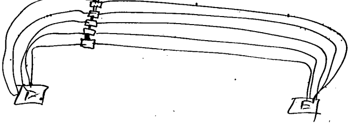
Compensation

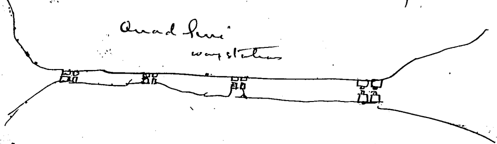
~~Nov 26 1877~~
Dec 7 1877
T A Edison

I propose to carry out this principle of Compensation in telegraphs of all kinds, If 4 lines disturb a particular one I use it thus


distbg
distbg
distbg
Distbg
Telephon line
E
E

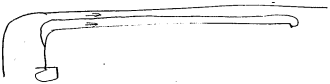
or

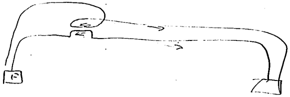


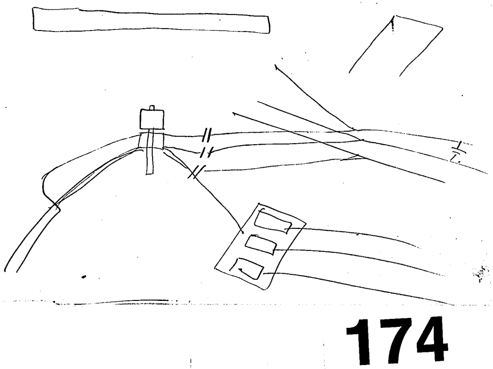

Quad line
way stations

Compensation

Dec 7 1877
T A Edison
James Adams

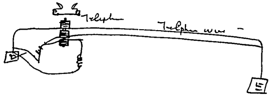




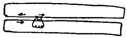


EDISON'S EXHIBIT. 175-13.

Compensating = Dec. 7/77


Teleph
Teleph wire
B
E

I think coarse wire must be used in magnet placed in circuit to be compensated for if such ck is of low resistance;



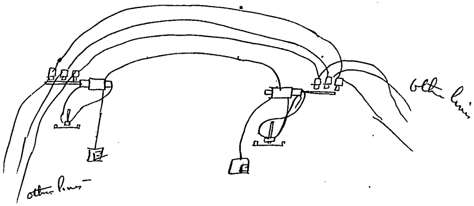
Boston –

13

EDISON'S EXHIBIT. 176-13.

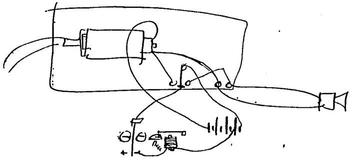
Compensation

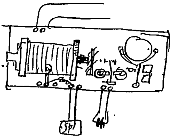
Dec 10 1877


other lines
other lines

EDISON'S EXHIBIT. 177-13.

Speaking Telephone. 11 Dec 15 1877
T A Edison



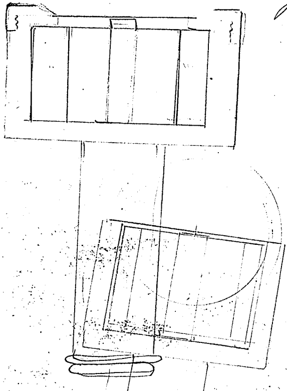


602

Speaking Telegraph.

Dec 17 1877

Chas Batchelor
James Adams



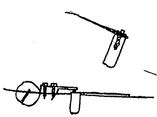
EDISON'S EXHIBIT. 179-13.

601

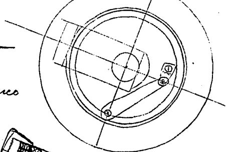
Speaking Telegraph

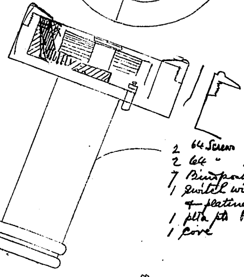
Dec 17th 1877

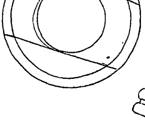
Chas Batchelor
James Adams



3 Bindposts
switch to cutout the resistance of induction Coil.







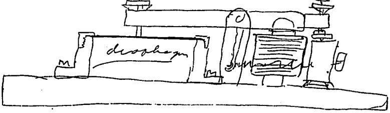
2 64 Screws 1/4 long
2 64 " 9/16 long
7 Bindposts
1 switch with rubber & platina point
1 plta pt bracket
1 core

EDISON'S EXHIBIT. 180-13.

604

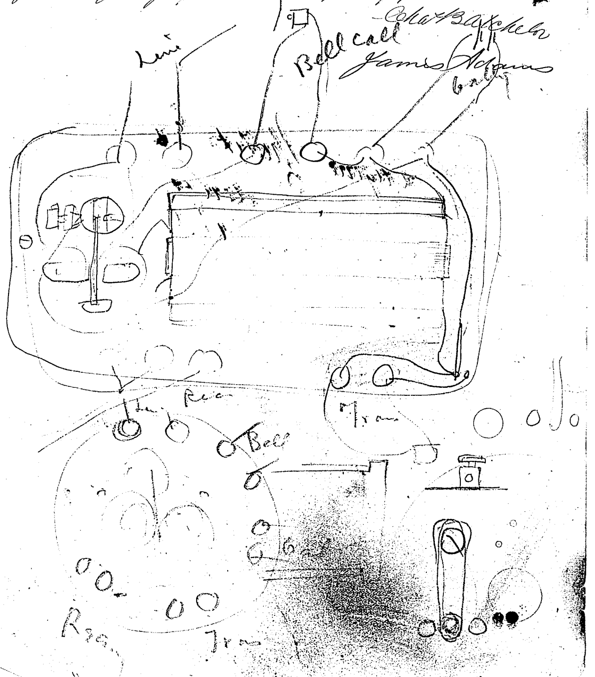
Spkg Telegraph

Dec 18 1877
TA Edison
James Adams


diaphragm
M
M
d

605

Speaking telegraph Dec 19th 1877


Line
Bell call
battery
Rec
Trans
Bell
Rec
Trans

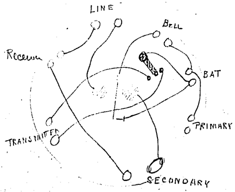
Chas Batchelor
James Adams

606

Speaking Telegraph

Dec 20th 1877

Chas Batchelor
James Adams


LINE
Bell
Receiver
BAT
TRANSMITTER
PRIMARY
SECONDARY

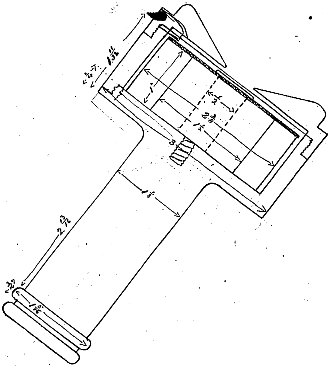
182

607

Speaking Telegraph

Dec 20th

Chas Batchelor
James Adams


1 11/32
1/4
1"
1/2
2 5/16
1 1/2
3
1 1/8
2 13/16
3/32
1 5/16

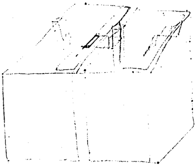
Inner Spool 140 ohms
outside spool coarse
wire to make up size

620

Gutter

Dec 20 1877
J A Kelley

James Adams



15.

15.

Test of Batteries for Speaking Telegh — Dec 20 . 1877.

James Adams

No 1.

1135 am = Watson. 2 minutes after pulling up 1 cell works
Bunnell sounder fairly -

on No 4 strap of Bradly gal gives def 9 1/4
" " 3 —— 50 1/4
" 2 —— 59
" 1 63

short ckted = no Zinc on plate

No 2

1143 am Watson

No 4 strap …… 13
No 3 —— 60
No 2 62
No 1 65 –

works Bunnell sounder somewhat stronger than No. 1 and sufficiently for a majority of ~~[illegible]~~ offices -

short ckted =

610

Battery test.

Dec 20. 77.

James Adams

Nos 1 & 2 Watson Compartment were [illegible] with all the solution required for signalling

No 4 Shop —	12
No 3	62
No 2	74
No 1	78

Connected for intensity & short ckt at 1152 a.m.

In No 2 Watson the blue got in contact with zinc but not in No. 1. that may account for lower internal R of No 2. Blue 1 inch from zinc in No 1

1154

Leclanche same Zinc & Mang Carbon only =

No 4 Shop. —	23
No 3 —	72
No 2 —	70
No 1	72 $\frac{1}{2}$

186

On No 4 stamp runs from 21 down to 17 in
25 seconds from 17 to 16 in one minute -
from 16 to 15 in 2 1/2 minutes.
Opening circuit 1 minute it goes to 17 1/2
& falls to 16 in 5 seconds
after this I put it to No 3 Coil ~~it~~ goes
to 64 - goes to 62 1/2 in 2 minutes - from 62 1/2
to 61 3/4 in 2 minutes
On No 2 Coil goes to 62 recovers on this Coil
to 63 1/4 - in 2 1/2 minutes goes to 64 in 2 minutes
more = Resistance of this Coil 30 ohms
works a Bunnells sounder [illegible] Chain
1 Water but not quite so strong as 2 Water.
polarizes slightly on Bunnell in 2 minutes
I adjusted it up high so it would just work in
2 minutes I was compelled to give adjusting
not 1/2 a turn to get it to work again
in 2 minutes more I had to give nut ~~a~~ 1/3rd
of a turn to get it to work in 2 minutes more
no adjusting necessary.

612

Continued.

I think this would be a satisfactory local if the sounder had a resistance Equal to No 2 Coil (~~Eqt R 30 ohms of No 2 Coil~~) & it would not then pbly polarize -

It occurs to me that ~~there is a point~~ this element does not polarize when furnishing a certain Volume of Current but any attempt to ~~get~~ obtain a greater amount Causes polarization as the means for preventing polarization is insufficient to prevent it when so great a volume is attempted to be forced from it by low ~~resis~~ External resistance -

---

Putting this Cell on No 4 goes to 11 1/2 showing that it has gradually polarized during the Experiment. in 1 minute it goes to 10 3/4 - on No. 2 it goes to 59 1/2 & recovers to 60 in 12 Seconds & gradually goes up showing does not materially depolarize or strengthen current -

6/3

Continued

No 2 Leclanche goes to 13 on No 4
on No 3 ———————— 61
No 2 66. & goes up
No 1 ———— 70 3/4

on No 4 polarizes from 13 to 11 in 28 seconds from 11 to to 10 in 1 minute, after this polarizes slightly =
on No 2 coil goes to 62 & recovers to 63 in 12 seconds & goes to 64 in 1½ minutes =
Works a Bunnell sounder like the others = The 2 together work sounder better than the 2 [illegible] & makes good local =
on No 4 goes to 15. polarizes to ~~4~~ 14 in 15 seconds to 13 in 30 seconds - to 12 in 1½ minutes =
No 3 Coil goes to 61 & polarizes slowly
No 2 Coil " 73 1/4 & recovers =

Ohms checked for uniformly =

12.40. PM =

Continued)-

Fuller battery. one No 1½ Carbon with [illegible] zinc in porous pot zinc 1/4 inch thick 2 inch wide & 5½ inch long. SO$_3$ spoonful in porous pot with 1 inch Mercury in Contact with zinc = Hg rather impure being loaded with zinc = 4 porous pots full mod strong Electropoion in each cell

No 4 shunt 82½

No 3 — 90

No 2 78 /4

No 1 79 –

No 2. of fuller

No 4 shunt 56

No 3 90

No 2 63

No 1 56

Connected for quantity & short circuited at 12 40 PM

Continued - No. 1.

The Regular Leclanche porous cell.

No. 4. strip ———— 57.
polarizes to 55 in 1 minute -

No 3 ———— 84 1/4.
dont polarize in one minute.

No 2 - 71 1/2
No. 1 ~~8~~ 82 1/2

Works Bunnell very strongly almost equal to Carbon - Cant adjust so high but what it will work.

Put it back on No 4 strip 55 =

Short circuited

Resistance galvanometer

No 4	Nil
No 3	1 ohm
No 2	30 ohms
No 1	150 "

Continued

Leclanche Continued -

been short circuited 12 minutes stood at 55 on No 4 when short ckted - now stands = ~~45~~ 47½

No 3 Coil 81½ recovers slightly after being shorted ckt'd on such low resistance

No ~~4~~ 2 Coil, 67½ recovers 1 deg in 1 minute

No 2. Large porous cell Leclanche Regular

No 4 Coil	36.
falling in 2 minutes to	31½ -
No 3 Coil	77
No 2 Coil	69
No 1 Coil	71

in Sounder not quite so strong as No 1 Cell apparently there is a great difference in the internal Resistance of these Elements which is an objectionable feature -

Continued

Short ckt'd them connected for intensity at 1.55 pm.

Regular 1½ Carbon: no SO_3 outside but little Red fluid outside ordinary rough & tumble way we do it here =

No 4 Cell	81
No 3 "	90
No 2 "	78
No 1 "	78 1/4

No 2. Cell do

No 4 Cell	87 3/4
No 3 "	90
No 1 "	78½

Short ckt'd for intensity at 2.12 pm.

Continued

Leclanche Regular 2 cells at 3 pm.

No 4 Coil	28
No 3 "	76 1/2
No 2 "	74
No 1 "	77

Works Bunnell sounder strong.

---

302 pm –
Leclanche One cell new style no paper

No 4	6 1/4
No 3	41
No 2	63
No 1	72

the 2 cell
works Bunnell satisfactorily not equal to the 2 Watson tested on next page which is ~~too~~ 1/3 of current twice as strong

619

Continued

Watson No 1 & 2 ~ 3,07 pm

No 4 Coil	23
No 3 "	73 1/2
No 2 "	74
No 1 "	76 1/4

Shellacked

New Telephonated Carbon

Arm stands 3 to 4 deg from Zero, loudest talking 41. which is ~~about~~ 20 ohms full in goes to 74 which is little less than 2 ohms, goes from 5 to 30 in. about 1/2 in turn or say 1/6 of a turn

Battery tests

Dec 22 1877

James Adams

415 PM.

Lechanche regular

NO 4 ———————— 16 ~~17~~

NO 3 55 ~~14~~

NO 2 54 recovers rapidly in 40 sec to 60

NO 1 62 opend ckt at 4 20 PM

at 437. NO4 ~~23~~ 25 = NO 3 70 NO 2 63

Fuller —

NO 4 Coil 10

3 " 51

2. " 59 ½

1 " 63

I find that the porous Cell ~~is~~ ½ full of a solid brownish substance & almost all the H2O gone in one cell & all gone in the other = although the outside solution is full up & has lost but little by Evaporation I refilled porous Cell;

NO 4 ~~Coil~~ 23

3 " 70

Left open

29

622

Continued - Dec 22

James Adams

The fluid outside is blue + played out .. I dont think much of the Fuller improvements =

Leclanche Small

No 4 Coil	2
3 "	7½
2 "	23
1 "	43½

Opened ckt at 431 PM

Watson :

No 4 Coil	~~38~~ 45
" 3 "	~~80½~~ 82½
2	~~77~~ 72
1	74

Opened 4.35 PM

Continued

Leclanche Reg

Whew!!

4 40 pm = No 4   30.   polarizes to 20 in 40 seconds

5 50 pm   No 4   41   polz to 30 in 40 seconds

at 6 PM left it on No 2 Coil - stood ~~[illegible]~~ 70!

Dec 23 1877

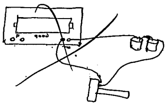
Leclanche Reg

9 40 am ~~No 4 Coil~~ I find ~~that~~ on No 2 Coil it stands at 75 having gone from 70 last night to 75 on a 30 ohm Coil

~~Menlo Park Dec 22 /77~~

T.B.A.D

~~The connections are thus~~


Transmitter;

63X

Dec 23/77

Batty

on 18 ohms 2 cells Leclanche Reg on 1 ohm shunt goes to 41 & polarizes to 39 & then remains Constant The two Watson on same goes to 46 and is of Course Constant hence as regards strength the Watson is superior to the Leclanche for Telephones =

I see that by opening the Leclanche 1 minute it goes to 42½ but polarizes to 40 in 20 Seconds = in 1 hour 38.

2 Cell Carbon new goes to 70 on Coil No 3 with 18 ohms =

1 Cell to 50, hence 2 watson is not quite Equal to 1 Carbon on this Coil & Resistance

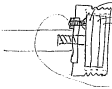
1205 PM I put 2 cell Carbon on No 3 Coil 1 ohm with 18 ohms in Rheo, stands 70° =

Dec 26th 1877

Model Telephone Transmitter
Sent to Murray.

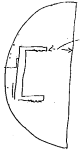
Chas Batchelor.

Bindposts have got 10/32 screws to screw in rubber —

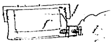

Screwhead thickness $\frac{7}{100}$
fluff $\frac{8}{100}$
Ivory $\frac{3}{100}$

Depth of cup $\frac{19}{100}$

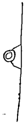
Countersunk head screw from inside and nut on outside for connection



top of cup ·22 from Diaphragm when adjusted up and ·32 when adjusted away.



Small stud to hold platina foil with screw in for connection



Height of rubber on Diaphragm ·28

~~screw .004~~

Screw	04
Ip plate	04
Fluff	08

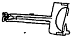
EDISON'S EXHIBIT. 202–13.

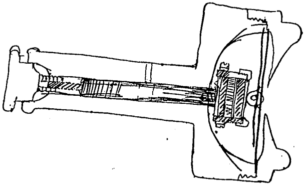
Speaking Telephone

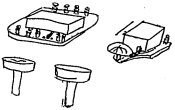
Dec 28 1877

T A Edison

Chas Batchelor







EDISON'S EXHIBIT. 203-13.

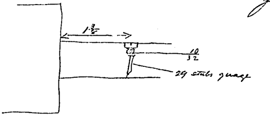
625

Speaking telegraph

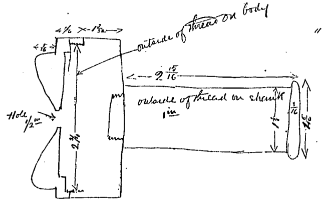
Dec 29th

Chas Batchelor
James Adams

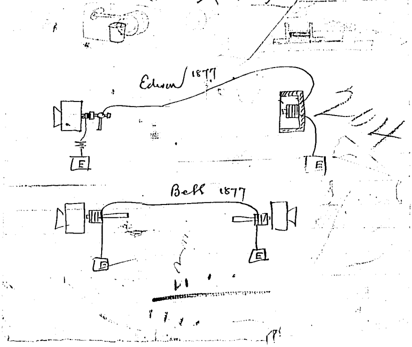
Murray model transmitter

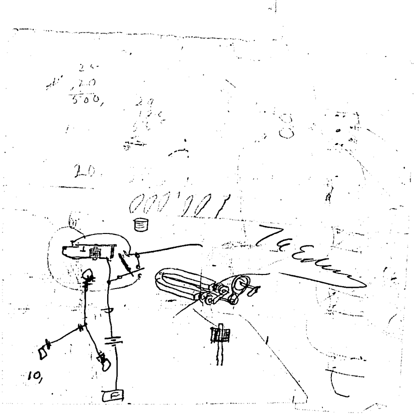

1 3/8
10/32
29 stubs guage

Diameter of Diaphragm ~~to~~ over all —
" Diaphragm. free to vibrate


1/16
1 3/32
1/16
outside of thread on body
2 15/16
outside of thread on shank 1in
Hole 1/2in
2 7/16
1 1/4
1/16
1 6/16

(X-E-1684) (Telephone)


Edison 1877
E
E
Bell 1877
E
E


25
20
500,
20.
T
10,